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Original Articles.

TWO CASES OF CARCINOMA OF THE KIDNEY, ONE WITH INVASION OF THE INFERIOR VENA CAVA AND RIGHT HEART.

By *WILLIAM S. QUINLAN, B.S., M.D.*

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THE first definite success in tracing the epithelial origin of tumors of the kidney was accomplished by Robin¹ in 1855, who showed that the tubular epithelium proliferated, destroyed the membrana propria, and produced cancerous nodules.

This discovery was soon confirmed by many other observers. Waldeyer,² in 1869, also traced the beginnings of renal cancer to proliferating cells of the renal tubules.

More specific details of the origin of renal tumors were obtained by Sturm³ in 1875, who distinguished between the solitary adenoma of normal kidneys and the multiple adenomata of sclerotic kidneys, and described the slow transformation of adenoma into carcinoma. Later, Weichselbaum and Greenish,⁴ in 1883, were able to designate two forms of adenomas; papillary and alveolar. Although these are not to be distinguished from each other macroscopically, the larger tumors may show in different parts of the same growth the microscopical characteristics of both forms. Since that time,

carcinomata of the kidney in one form or another, have, from time to time, been reported by various observers.

In the majority of cases, these tumors were found to be confined to the kidney involved, some, by extension, affected the adrenal, while others invaded the inferior vena cava and right heart, producing generalized metastases. Jacobson and Goodpasture,⁵ in 1918, quoted 314 cases of obstruction of the inferior vena cava, collected by Pleasants, 29 of which were due to new growths in the kidney, and also added another very striking case of intravascular invasion by a hypernephroma.

From 1912 to the present, 262 cases of tumor of the kidney have been reported. Of these, 71 were carcinoma, 81 hypernephroma, 119 sarcoma, and other tumors.

Perhaps of all the interesting cases reported, that of Newman⁶ is worthy of mention, for the sake of comparison with the complete case of the writer's. Newman's case, in brief, is as follows:

The kidney was found to be occupied by a cancerous tumor the size of a cricket ball. The greater part of the growth was of a bright red color and firm consistence, but here and there presented points where softening and hemorrhage occurred. On section, the tumor appeared to be limited by a capsule from the surrounding tissue.

This primary growth had given rise to a rapid dissemination throughout all organs of the body. Nodules of various size, from that of a millet seed to that of a hazel nut, were found in almost all the organs; e.g., the stom-

ach, intestine, liver, brain, heart, lungs, suprarenal capsule, lymph nodes, and on the serous mucous and cutaneous surfaces. Indeed, the pancreas and spleen were the only two organs observed to be free from secondary growths.

It is to such a case, one of still greater involvement and less frequent occurrence that the attention of the reader is especially directed.

Recently, while assisting in the Department of Pathology at the Peter Bent Brigham Hospital, four cases of carcinoma of the kidney were encountered. In one, a hypernephroma and papillary carcinoma existed as separate and distinct masses in the same kidney. Two showed adenocarcinoma without metastases. The other, encountered at autopsy, showed papillary adenocarcinoma with invasion of the inferior vena cava and right heart and generalized metastases.

A complete report of two of these cases forms the basis of this paper.

I wish to express my thanks to Dr. Ernest W. Goodpasture for the valuable assistance he gave me in the preparation of these cases; also to the Urological Service of the Peter Bent Brigham Hospital for allowing me to use their records.

CASE 1. Anatomical Diagnoses—Carcinoma of the kidney with metastases to liver, heart, lungs, adrenals, lymph nodes and mesentery. Tumor thrombus of inferior vena cava and right auricle. Chronic passive congestion of liver and lungs. Chronic nephritis. Chronic bronchitis. Atrophy of spleen. Arteriosclerosis.

Clinical History—Patient, T. T., aged 55 years. American. Occupation, janitor. Admitted to the Collis P. Huntington Memorial Hospital January 30, 1920. Chief Complaint—Growth in left neck, axilla and groin. Present Illness—Noticed growth on neck four months ago. A few weeks later he noticed glands in left axilla and on left groin. Two months ago, a growth was removed from left neck and axilla. Has had no further treatment. Complaints of shortness of breath. Family History—Negative.

Physical Examination—February 9. A well-developed and fairly well nourished Negro of large frame. Pupils react to light and distance. Arcus senilis present. Tongue protrudes in median line without tremor. Thyroid not enlarged. Heart—Apex beat visible in the fifth space 9 cm. to left of median line. Regular, rapid, no murmurs. P₂ +. Lungs—Resonance poor on right to third rib; otherwise clear. Vocal resonance and tactile fremitus unimpaired. Sense of resistance with slight tenderness throughout upper half of abdomen, which abdomen is prominent. No fluid. No masses of viscera felt. Extremities—Knee jerks not obtained. Legs and feet edematous, most marked on the right. Axillary glands not enlarged. One

non-adherent nodule in right epitrochlear region.

Local Examination—Throat slightly red, otherwise negative. There is a small gland at angle of jaw on each side of neck. In midline, posteriorly, over the 4th to the 7th cervical vertebra, is a diffuse oval tumor 7 cm. in greatest diameter. Just to the left of this is a smaller tumor 3 cm. There is a hard mass of discrete glands at border of pectoral muscle on left which extends up into the skin. Scar of recent operation 1 cm. over this freely movable tumor on right chest is seen. An oval mass of 10 cm. is in the region of the left kidney. This mass seems adherent to deeper structures; cannot be well felt. Both groins, mass of small glands with sense of deep resistance in both iliac fossae. There is edema of both feet and legs. On center of back of the right thigh, situated deeply in muscles, is an oval tumor 10 cm. in diameter, and there is another of like character in calf muscles of left leg.

July 26—General condition much worse than at last admission, July 5th. Tumor masses about as last described, save that walnut-size gland in left groin is somewhat painful, slightly tender and fluctuant. Abdomen is markedly distended, particularly in epigastric region, tympanitic over this area; shifting dullness in flanks; definite fluid wave. Accumulation of fluid interfering with respiration. Tapping recommended.

July 27—1500 cc. fluid was removed. The patient was put back to bed in a weakened condition. Palpation of abdomen now shows large mass extending across epigastrium and beneath either costal margin.

July 28—Patient very uncomfortable, complaining of abdominal pain, particularly on the right side. Urine this morning is very bloody. Abdominal distention again quite marked this A.M. Fluid apparently reaccumulating. Patient's general condition is poor. Eats very little. No vomiting. About 9 A.M., patient complained of feet feeling cold and of his hands being numb. Respiration about 35, pulse 130, temperature normal. Condition much poorer than this morning at 10 o'clock, pulse was 140 and weak. Respiration, 35-40. Patient somewhat delirious and gradually failing. Pulse running from 140 to 160. Respiration going up to 50. Delirium increasing. Patient died at 11.10.

Clinical Pathology: January 30—Blood not remarkable. February 3—Wassermann negative. February 9—Urine yellow, clear; specific gravity, 1016; albumin, trace; sugar negative; acid. Microscopic examination shows many pus cells, few round and flattened epithelial cells. July 27—Aseptic fluid 1500 cc. Gross and microscopic blood. Specific gravity, 1014. Albumin, 7%. Smear shows large mononuclear cells with a few cells resembling somewhat the large mononuclears in staining, but

larger, and with large bilobed granular nuclei. These were consistent with "tumor cells." July 27—Urine. Specific gravity 1020. Gross and microscopic blood. Few pus cells, round and flattened epithelial cells. Albumin, trace. Sugar, negative.

Necropsy—Performed twelve hours post-mortem by Drs. E. W. Goodpasture and W. S. Quinland. **Body**—The body was that of a well developed, well nourished Negro, measuring 160 cm. in length. There were multiple nodular tumor masses of from 2 to 6 cm. distributed over the body in the regions named above. There was protuberance of the abdomen and a moderate amount of edema of the extremities. **Primary Incision**—Showed a slight amount of subcutaneous fat over chest and abdomen. The muscle was pale and wet, indicative of interstitial edema. **Peritoneal Cavity**—Contained 1700 cc. of reddish fluid that coagulated into a gelatinous mass shortly after removal. There were firm adhesions between the liver and a large tumor mass in the left hypochondriac region. There were tumor masses of .5 to 2.5 cm. on the upper third of the mesenteric attachment of the ileum and a similar pedunculated mass measuring 1 cm. on the terminal portion of the ileum. There was also a tumor mass of 4 cm. in the mesentery of the ileum. The appendix appeared normal. The mesenteric and retroperitoneal lymph nodes were not remarkable. **Pleural Cavities**—Contained no fluid. There were a few fibrous adhesions in the upper posterior portion on the right side. **Pericardial cavity** contained a small amount of clear, straw-colored fluid. **Heart**—The heart weighed 340 gms. The epicardium was entirely devoid of fat. Over the surface were seen many calcified and tortuous vessels that stood prominently above the surrounding areas. There were also small tumor nodules about 3 mm. in diameter scattered irregularly over the surface. On opening the right side of the heart it was found to contain a tumor mass of rather soft consistency and of a blood-tinged color that was adherent to the posterior wall of the auricle and almost filling the entire cavity. This mass was continuous with one of similar consistency that filled the inferior vena cava as far down as the renal veins, where it entered the left renal that leads from a tumor mass of considerable size in the lumbar region, apparently the primary focus of invasion.

The myocardium was dark red and of soft consistency. It contained numerous circumscribed tumor masses of from 2 to 6 mm., the largest of which was situated at the apex. The papillary muscles, columnae carneae and valves were not remarkable, although there were a few small tumor masses of about 2 mm. on the left auricular endocardium. Measurements were: T. V., 13 cm.; P. V., 9 cm.; M. V., 10 cm.; A. V., 8 cm.; L. V., 1.7 cm.; R. V., 4 cm. Lungs—The right lung weighed 570 gms. and the left

580 gms. They were somewhat similar in appearance except for a small area of about 3 cm. on the posterior right upper lobe, where there were fibrous adhesions and some loss of lung tissue torn in the act of removal. There were numerous tumor metastases varying in size from 2 cm. to 3 cm. in both lungs. The surfaces were dark gray, having mottlings of anthracosis. The lymphatics were dilated and filled with what appeared to be tumor cells, causing the vessels to rise above the surface as irregular white lines. Section through the organ showed the cut surfaces to be dark red, somewhat dry, and having dark fluid blood escaping from the veins. There was no evidence of an exudate. The picture was that of a chronic passive congestion. The bronchi were injected and contained a small amount of bloody mucoid exudate suggestive of a chronic bronchitis. **Spleen**—Weighed 60 gms. It was atrophic, having a capsule that was much wrinkled and of a steel grey color. The consistency was firmer than normal and on section the pulp, which was rather red, was not easily scraped away. Malpighian corpuscles were faintly seen as small grey areas. The blood vessels were thickened and there was an apparent increase of stroma. There was no evidence of tumor. Below the tail of the pancreas was a spherical accessory spleen measuring 2 cm. in diameter. **Gastrointestinal Tract**—Showed nothing abnormal. **Pancreas**—Although of a soft consistency, was normal in color and showed no evidence of tumor in the gross. **Liver**—Weighed 2320 gms. It was dark red in color, having numerous tumor masses of from 1 to 11 cm. in diameter, distributed over the surface. These masses extended into the substance of the organ, causing pressure atrophy of the adjacent liver cells where the lobules were seen as irregular outlines having central areas of congestion and separated by an increase of fibrous tissue. A portion of the left lobe corresponding with the extent of a large tumor mass, apparently the adrenal, to which it was firmly adherent, measures only 6 cm. in thickness. The gall-bladder and ducts were normal. **Kidneys**—The right kidney weighed 270 gms. It was very much larger than normal. The capsule was markedly thickened and stripped with considerable difficulty from a surface that was dark red, granular and cystic. Section through the organ showed the cortex to be slightly yellow and injected. The glomeruli were also injected and appeared as pin-point elevations. In the cortex there were a few cysts of about 1 to 5 mm. containing clear fluid. The medulla was of a dark red color, the central portion of which was replaced by a circumscribed, dark red, bloody tumor measuring 2.5 x 4 cm. that extended upwards from the pelvis. There was no hydronephrosis. The ureter was not remarkable. The left kidney was replaced by a spherical mass weighing 950 gms., having a di-

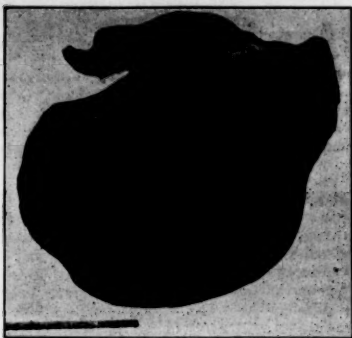


FIG. 1.—Case 1. Section through primary tumor of kidney, showing necrosis and irregular cysts filled with dark red, viscous material. At upper right aspect is seen the remainder of the kidney tissue.



FIG. 2.—Case 1. Adrenal, invaded by tumor, weight 480 gms and measures $10 \times 8.5 \times 6.5$ cm. The mass was wedged in transversely between liver and the primary tumor.



FIG. 3.—Case 1. Portion of ileum and attached mesentery, showing tumor metastasis.



FIG. 4.—Case 1. Low power. Metastasis to heart. Showing heart muscle below, and tumor metastasis above.

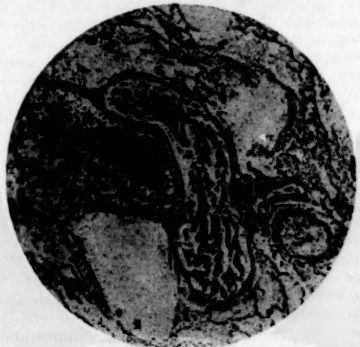


FIG. 5.—Case 1. Low power. Section of lung showing tumor invasion of lymphatic vessel. Above and below this are seen congested blood vessels.



FIG. 6.—Case 1. Low power. Section of lung showing diffuse tumor metastasis. Note characteristic papillary arrangement of cells.

imeter of 12.5 cm. At the inferior portion of this mass was a small portion of the kidney tissue measuring 4.5 cm., that shaded off gradually into the outer surface of the tumor mass above. The whole was surrounded by a rather thick fibrous capsule of about 3 mm. thickness, the upper portion being firmly adherent to a semilunar mass above, seemingly the left adrenal. The cut surfaces showed irregular masses of dark red necrotic material and several cysts containing dark red, viscous fluid. Embedded in the tumor mass in the region of the remaining pelvis was a rough, yellow calculus of about 1.5 x 2 cm. Adrenals—What appeared to be the left adrenal was seen as a semilunar tumor mass measuring 18 x 8.5 x 6.5 cm. and weighing 480 gms. The curved inferior surface was firmly adherent to the tumor below, while its superior convex surface was attached to the much thinned out left lobe of the liver. It was of a dark red color, and presented a shaggy appearance over the surface, due to many fibrous adhesions. The consistency was spongy, although in places a few firm areas were felt in the mass.

Cut sections through the tumor showed yellow, irregular patches of necrosis distributed in the more uniform dark red hemorrhagic tissue that formed the bulk of the tumor.

The right adrenal was about three times the normal size. The greater portion was adherent to the posterior surface of the kidney. There were a few white tumor nodules of 4 mm. on the surface of the organ. The medulla was congested. Genitalia—Prostate was large, firm and translucent. Aorta—Showed a definite thickening. The intima was irregularly roughened by yellow plaques that were most numerous in the abdominal portion. The appearance was that of arteriosclerosis. Brain—Appeared normal in the gross. Coronal sections of 2 cm. showed no evidence of tumor. Bone Marrow—Was of a rather soft, almost fluid nature, dull grey in color and irregularly tinged with blood. Microscopic Report: Diagnoses—Acute and chronic myocarditis. Pressure atrophy and necrosis of the liver. Arteriosclerosis, thrombosis and calcification of left coronary artery. Chronic vascular nephritis and pyonephrosis. Chronic prostatitis.

Tumor—The microscopic appearance of sections taken from various portions of the tumor, is that of papillary adenocarcinoma of the kidney. There is a delicate connective stroma, arranged in finger-like processes throughout the sections. These processes are surmounted by two or three layers of cuboidal epithelial cells, having large, deeply stained nuclei and rather basic staining cytoplasm, resembling somewhat those of the convoluted tubules. Although there are slight variations in the size of these cells, the papillary arrangement is unaltered, except in places where there is extensive necro-

sis where they become loosely scattered among polymorphonuclear leucocytes.

Heart—The picture is that of chronic fibrous myocarditis with carcinoma metastasis and acute inflammatory change. There are several sections showing variable degrees of the above named processes, ranging from necrosis of isolated cells to patches of fibrous infiltration resulting in pressure atrophy and replacement of many of the muscle fibers. The muscle cells in general contain brown granular pigment, while one section shows patches of hyalinization and fragmentation. Other sections show tumor invasion of the myocardium and visceral pericardium, and dissemination of numerous polymorphonuclear leucocytes among the tumor cells. Section of one of the large veins with attached myocardium and tumor, shows a very marked degree of fibroplasia. The morphology and arrangement of the tumor cells are identical with those of the primary tumor.

Lung—There are two sections showing marked congestion and tumor invasion. The alveolar capillaries and larger vessels are all engorged. The alveoli are filled with vesicular and granular contents indicative of an associated edema. A few escaped red blood cells are also seen in the section. One section shows extensive tumor metastasis by way of the lymphatics, which are considerably dilated and partially filled with tumor cells that maintain their original papillary arrangement; the process being most marked in the lymphatics surrounding blood vessels. The other section shows a diffuse tumor mass of similar papillary arrangement, having numerous necrotic foci with large accumulations of polymorphonuclear leucocytes and debris. Here the tumor is extending by direct invasion and is seen in one place to penetrate the wall of a bronchus. There is also an area of hemorrhage adjacent to, and invading a portion of the tumor. The surrounding lung tissue is atelectatic. Lymphatics of the visceral pleura show similar tumor invasion. Spleen—There is passive congestion of the organ. The sinusoids are all filled with blood and there is a relative decrease in the number of pulp cells, except polys, which are somewhat increased. The Malpighian corpuscles are well defined, the arterioles of which show hyalinosis of the elastoid coat. Larger blood vessels are greatly thickened. The capsule and trabeculae are normal. There is no evidence of tumor metastasis. Accessory spleen shows processes that are identical. Liver—There are several sections showing processes that are different. The predominant feature is pressure atrophy of the liver cells, either as a result of massive areas of hemorrhage, diffuse fibroplasia or tumor invasion. There is chronic passive congestion, causing central necrosis and hemorrhage; the latter extends to the periphery of the lobules. In many places several adjacent lobules are thus involved. Isolated liver cells

in these patches show bile stasis as seen from the large amount of green pigment they contain. On the whole, the normal architecture of the organ is destroyed. Wherever there is extensive fibroplasia or tumor invasion, there is decided atrophy of the liver cells, many of the columns appearing as irregular and broken chains of nuclei. The morphology and arrangement of the tumor cells are not unlike those of the primary tumor. A few foci of fatty infiltration are also present. The capsule is not remarkable. One section shows a small cyst of 2 mm. lined with low cuboidal epithelium and containing acidophilic granular material. **Pancreas**—Normal. **Kidney**—There are two sections from the right kidney showing diffuse nephritis and pyonephrosis. Most conspicuous of the various changes is the extensive infiltration of polymorphonuclear leucocytes. These are not confined only to the interstitial tissue, but fill many of the tubules, particularly those of the medulla. Some of the tubules contain large hyaline casts while others are filled with red blood cells. The glomeruli are irregular in distribution, many have their capillary tufts and capsule thickened, while others show more advanced changes as evidenced by tremendous atrophy. There is very marked arteriosclerosis of the larger vessels and hyalinosis of the elastoid coat of the arterioles. A moderate amount of congestion is present, and judging from the amount of blood in some of the collecting tubules, the conclusion is that there must have been a decided hematuria.

Section of the remaining left kidney shows compression atrophy of the parenchyma where the tumor is seen to be growing by direct extension, and surrounded by a rather thick, fibrous capsule that forms a limiting wall. There is an interstitial infiltration of small lymphocytes, fibrosis, casts and other signs of chronic diffuse nephritis. The most striking features are, however, the papillary structure and occasional necrosis, characteristic of the tumor elsewhere.

Adrenal—Sections show no evidence of normal architecture of the organ. There is a diffuse, but loose connective tissue stroma containing fat, and endothelial cells. There is invasion of tumor cells that assume an alveolar arrangement in places, and a loose or papillary distribution in others. Tumor cells in the same field show marked variations in size and shape, where they appear both as large and small cuboidal with large, deeply stained nucleus and fusiform cells that are to be differentiated from young fibroblasts. In direct contrast to these, are the very few adrenal cells scattered in small groups of 3 to 10 over the section. These take the acid stain and in places are filled with brown granular inclusions. Many of the sections show ancient and recent areas of hemor-

rhage, while a few show necrotic foci and polymorphonuclear infiltration.

Left Coronary Artery—Shows marked arteriosclerosis and thrombosis. The media is greatly thickened and at one point it is partially dissected by the thrombus, the upper layer of which is covered by the split intima of the vessel. Hemosiderin pigment is scattered over the section. The process appears to be an atheromatous plaque with ulceration and attached thrombus. **Aorta**—Section was cut through a typical atheromatous plaque. There is marked thickening of the media, which in places is separated from the intima by foci of fat that cause bulging of the latter coat. **Vena Cava**—The vessel is irregularly thickened by foci of fat in the coats. At one point, there is marked fibroplasia and a considerable number of endothelial cells containing hemosiderin pigment. There is also an invasion of loose tumor cells between the coats, while at another point the characteristic papillary arrangement is seen in an attached thrombus. A large portion of the mass is necrotic and shows numerous cholesterol clefts.

CASE 2. From the Urological Service of the Peter Bent Brigham Hospital. H. L., 52 years. S-19-636. **Material**—Left kidney. **History**—Patient complains of pain in the back, pain beneath the right costal margin and gradual loss of weight. Since June, 1919, patient has had nocturia. Two weeks ago he had a severe paroxysmal pain over the pubis on the right side, lasting for three hours and followed by the passage of pure blood in the urine. **Operation**—Exploration of right flank with removal of tumor, by Dr. J. V. O'Connor. **Subsequent History**—It is important to know that the patient, Case 2, was operated September 11, 1919, and was discharged from the hospital October 11, 1919. On January 20, 1920, his physician notified the Hospital that the patient was doing well. The patient, however, died two weeks later of carcinoma metastasis.

Gross Description—Specimen consists of a right kidney tumor weighing 936 gms and measuring 12 cm. from pole to pole, and 10 cm. from the pelvis outward in the median section. In thickness, the measurement is 10 cm., not including a thick layer of perirenal fat which is very adherent to the surface of the tumor mass. The external surface is smooth, but most of the surface presents rounded, irregular nodules, red in color, with the exception of one that is quite firm upon palpation and white in color. Sectioning through the median line in the mass, the surface upon inspection presents no normal kidney structure or substance, the whole kidney being apparently replaced by lobules of spongy and firm tumor tissue. On close inspection, however, at both lower and upper poles, there is still a very thin shell of cortex measuring not over 2 mm.,

which shows definite glomeruli. This small amount of renal tissue extends for only 2 to 3 mm. along the edge, when it disappears, becoming a mere layer of fibrous tissue which surrounds and apparently bounds the growing tumor cells. The pelvis of the kidney is filled with a mass of fat and nodular tissue which is about 8 cm. long and 2 cm. thick, and in its centre there is a small, hard, apparently calcareous mass or nucleus. The entire mass seems to be attached to one side of the pelvis where the lining membrane of the pelvis ends. This membrane is for the most part soft, smooth and glistening, but there are seen to be small implantation areas of cells. The cut surface of the kidney shows a large, firm, white area centrally located, measuring 4 x 5 cm. This area stands out in contrast to the rest of the areas of tumor tissue because of its white color and

firm structure. The other portions of the tumor, which are definitely localized, separated, and surrounded by white fibrous tissue bands, are red in color, of spongy consistency and have a more medullary and glandular appearance. Tissue from the tumor was fixed in Zenker and a frozen section presents the picture of medullary carcinoma.

Microscopic Report—There are sections from four different portions of the tumor stained with eosin methylene blue and phosphotungstic acid hematoxylin. The sections present widely different appearances, according to the portion of the tumor from which they came. Three of the sections present a somewhat adenomatous structure which is built up of tubules and small cysts with papillary ingrowths lined by columnar cells, most of which are of vesicular outline, due to a marked vacuolization. This portion of the tumor is divided up into larger and smaller nodules by a fairly heavy framework of connective tissue and in some places bands of smooth muscle, the latter possibly derived from the kidney structure. The cells forming tubules are supported by a very delicate connective tissue abundantly supplied with capillaries and suggest the renal origin of the tumor. Sections stained for fat, after fixation in Klotz fixative, show a very slight amount of fat or rather lipid material as the color of an occasional granule is pale orange with Scharlach R. This portion of the tumor contains small areas of hemorrhage, both recent and old. The other portion of the tumor corresponding to the dense, white nodule noted in the gross presents a complex appearance. In one portion it is definitely invading the capsule and has the structure of carcinoma with abundant stroma. Other portions present solid masses of rather vesicular epithelial cells with slight tendency toward alveolar formation. The bulk of this portion, however, is composed of spindle-shaped cells accompanied by a small amount of diffusely distributed intercellular substance which stains a feeble yellow with phosphotungstic acid stain, and on the whole, presenting the appearance of a sarcoma rather than a carcinoma. There seems, however, to be a transition from the adenocarcinomatous appearance to this structureless portion. The cells of both portions have some features in common, namely, somewhat vesicular appearance and in the size and chromatin content of the nuclei. It is also worthy of note that these areas contain considerable dark brown granular pigment enclosed within phagocytic cells and my interpretation is that in these sarcoma-like portions we have a simultaneous growth of tumor and fibroblasts which have replaced areas of hemorrhage. Mitotic figures are abundant in all parts of the tumor, particularly abundant in the last described portion. **Diagnosis**—Carcinoma of the kidney.



FIG. 7.—Case II. High power. Showing papillary adenomatous arrangement of tumor cells in original tumor mass.



FIG. 8.—Case II. High power. Showing mitotic figure and variation in size and shape of cells in solid portion of original tumor.

CONCLUSIONS.

1. I believe these tumors to be primarily of renal cell origin because of the papillary arrangement of the cuboidal cells much like that of adenoma of the kidney. Also, the finding of groups of typical adrenal cells so easily differentiated from the tumor cells present in the adrenal gland, makes it more apparent that the tumor must be of renal origin and not a hypernephroma.

2. That Case 2 is an adenocarcinoma of renal origin which has in places taken on the characteristics of a more malignant form of carcinoma with a loss of gland-like structure, and the possibility of producing subsequent metastases.

3. These cases are of very great interest and importance, as they indicate the origin of carcinoma from renal epithelial cells. Although there is nothing in the least degree original in the opinion that carcinoma arises in the first instance in this way, one seldom sees a case in which the structure of the original tumor and its metastases approach so nearly the structure of adenomata of renal cell origin.

4. The relatively low statistics of cancer of the kidney are due to the many difficulties in making a correct diagnosis of the disease and to the tendency of classifying these tumors as hypernephroma.

5. Invasion of the inferior vena cava and right heart is of comparatively rare occurrence, such cases being diagnosed only at autopsy. The frequency with which the liver is affected in such cases as compared with the spleen and other organs, makes it probable that invasion of this organ is effected by way of the hepatic veins.

6. It is of interest, though not surprising, that carcinomata of renal cell origin may show many of the characteristics of malignant hypernephromata of adrenal origin, such as a marked tendency to invade the renal vein, since the cells from which they originate are embryologically so similar.

7. The cause of death in Case 1 was due to cardiac and respiratory failure, as a result of tumor metastases, chronic nephritis with a superimposed acute inflammatory change reaching the proportions of a pyonephrosis.

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CONGENITAL ATELECTASIS*

By SAMUEL A. COHEN, M.D., BOSTON.

[From the Infants' Hospital Boston.]

DEFINITION

CONGENITAL atelectasis as defined by Lord,¹ is a condition in which parts or the whole of one

or both lungs persist in an uninflated state after birth. Dunn² states that atelectasis is a pathological process in which the fetal state persists beyond the early days of life. Pulmonary atelectasis is a term reserved for instances in which a portion of lung, once normal, has returned to its ante-natal state of deflation, either because of extra-thoracic or intra-thoracic conditions.

ETIOLOGY

Congenital atelectasis occurs in premature and feeble babies. A frequent cause is a birth injury to the brain or central nervous system involving the respiratory apparatus. This may result from cerebral hemorrhage, prolonged or difficult labor or instrumental delivery. Inhaled meconium, mucous, or amniotic fluid, by obstructing the bronchi, may directly cause congenital atelectasis. Intrathoracic or extra-thoracic mechanical hindrances to breathing, congenital weakness, or imperfect development, may also be sufficient to prevent complete inflation of the alveoli. It is uncertain whether those cardiac defects commonly found with congenital atelectasis are a result or a cause of it, at any rate, imperfect pulmonary circulation is present. When the lungs do not function properly, due to the above causes, there is deficient oxygenation of the blood and hence a lowering of the body temperature, which diminishes innervation and further weakens the muscle action of respiration. There then occurs a vicious circle with congenital atelectasis a decided factor.

EMBRYOLOGY

According to Kölliker,³ elastic tissue appears in the largest bronchi in the fourth month of foetal life. The air cells or alveoli of the lung begin to form in the sixth month and their development is complete at term. It is evident then that an infant born before term would be considerably handicapped by its imperfect pulmonary development.

PHYSIOLOGY

Russel-Burton Opitz⁴ states that at first only a limited number of alveoli are rendered air-containing; the succeeding movements distend these and develop others in increasing numbers until the organ as a whole becomes fully expanded. But the important fact to remember is that the rather sudden increase immediately after birth in the capacity of the thoracic cavity

brings with it a sudden influx of air into the passages of the lungs, resulting in an equally abrupt increase in their volume. Healthy infants under favorable influences establish the function of respiration during the first few minutes of life by a few vigorous healthy cries. However, several days elapse before the infantile lung is distended in its entirety.

There are three factors concerned in the regular rhythmic movements of respiration:

1. The respiratory centre, which gives out impulses which finally reach the muscles of respiration;

2. The vagus nerve, through which impulses pass from the lungs to the respiratory centre during each complete respiration;

3. The chemical condition of the blood.

The respiratory centre is very sensitive to any rise in the tension of CO_2 in the blood. In the new-born's circulation, the maternal circulation having been cut off, CO_2 , having been hitherto disposed of through the maternal circulation, now accumulates and stimulates the respiratory nerve centres, thus exciting the acts which govern inspiration and expiration. (It should be noted however, that CO_2 , acting too long, paralyzes instead of stimulates, respiration.)

This central nerve stimulation alone is probably not sufficient to cause strong inspiratory movement; but is assisted by the cutaneous nerves. The sudden change of environment of the new-born, from the aquatic to the terrestrial, and from a temperature of 99°F . to 70°F . causes reflex action of all muscles, especially the respiratory.

PATHOLOGY

Jörg in 1832 properly interpreted atelectasis. He was the first to call attention to the fact that atelectasis in the new-born was not due to preceding inflammation but simply to the persistence of the foetal state. In 1844 M. M. Bailly and Legendre,* proved that collapsed lung could be brought to the healthy state by insufflation, thereby proving that collapsed lung was not the result of inflammation.

In infants who have never breathed at all, the lungs will be found in the foetal condition, i.e., complete atelectasis. The lungs are of uniform color, chocolate, maroon or greyish red. They are tough, inelastic and non-crepitant. The cut surfaces show smooth, dry, homo-

genous areas. The lungs themselves being retracted with edges sharp and incurved.

In infants who have breathed, the extent of atelectasis varies from a partial atelectasis of one lung to a complete atelectasis of both.¹ The parts most often involved are the paravertebral and central portions, the areas behind the hilus being most frequently affected. The expanded areas are seen along the anterior borders and median surfaces. This is undoubtedly due to the fact that the immovable parts of the lung, the roots, apices, posterior borders and that portion of the external surfaces which underlies the lateral part of the vertebral column, undergo the least displacement. The most mobile areas are those furthest removed from fixed parts, that is, their inferior and anterior borders and median surfaces.² These inflated areas can be easily distinguished from atelectatic areas by the pale red color, the raised surface, and the crepitus of the former.

Microscopically, Peiser³ states that these areas show an absence of alveolar structure and that were it not for the presence of bronchi, the pulmonary tissue would be hardly recognizable as such.

The liver, spleen, intestine, and kidney, usually show enlargement, due to the stasis in the pulmonary circulation. A very common occurrence is the finding of congenital cardiac defect, usually an open foramen ovale or patent ductus arteriosus. Since only part of the lung tissue has access to its circulation, a higher blood pressure is maintained in the pulmonary circulation, which wholly or at least partially explains the failure of the foetal openings to close.

SYMPTOMS

Atelectasis even to a considerable degree may be found at necropsy in an infant who in life presented few or no symptoms.

Most hospital cases show a small infant, with cold extremities, a feeble cry or a failure to cry, in some instances even after having been pinched. Very rarely do these babies cry loudly. Not infrequently there is a dusky color or cyanosis, which usually clears on crying or upon an attempt to cry. There is also failure to thrive and develop properly.

A large percentage of congenital atelectatic babies fall asleep on the breast, are unable to grasp nipples, too weak to suckle, become easily exhausted while nursing, or have difficulty



in swallowing. Then we have a vicious circle: the breast secretion not being stimulated by sufficient suckling, the baby becomes weaker from lack of nourishment. "The breast milk was no good" or "Not enough," is an altogether too common reason for the discontinuance of breast feeding without further investigation on the part of the mother or even the attending physician. It is tragic that over 85 per cent (of our one hundred cases taken at random) were taken from the breast, and perhaps needlessly, before they were six weeks old.

Some of these infants present themselves as feeding problems. Vomiting, constipation and failure to gain are not uncommon occurrences. Constipation is often due to starvation. Usually babies with congenital atelectasis are stuporous but are classed as "good babies" by their mothers,—"Sleep most of the day and night and are even difficult to awake for feedings."

Attacks of dyspnea and cyanosis, which disappear almost as quickly as they appear, may be the only symptoms to attract attention. In these attacks there is a sinking in of the lower ribs, instead of expansion, during inspiration. In some cases the breathing is shallow and irregular. Convulsions are not rare in the first weeks of life; they occur more often in babies with cyanosis. In a very small percentage of cases there is oedema.



There may be a cough persistent from the time of birth. Occasionally this cough is accompanied with a history of sudden illness and difficulty in breathing. Seldom is there a temperature present. Necropsy in these cases sometimes reveals an intercurrent bronchial catarrh, to which may probably be attributed the sudden appearance of the symptoms. At other times, however, nothing is found which will account for their acuteness. Autopsy after the sudden death of an apparently normal infant sometimes discloses congenital atelectasis.

PHYSICAL EXAMINATION

Physical examination will usually show a feeble, cold, puny baby, unable to cry, skin and mouth dry, depressed fontanelle and subnormal temperature. Local examination of the chest may reveal nothing definite except poor resonance throughout. Comparison of the two sides of the chest, if both lungs are equally affected, is of no value. Often, both tops and bases will be impaired. There may be increased resistance and marked dullness over the affected areas and hyperresonance over the rest of the lungs. Sometimes normal resonance may be heard even with light percussion because of normal or emphysematous lung tissue near by. Auscultation may sometimes reveal medium course rales, although more often, fine crackles or showers are heard, especially if the infant is made to breathe deeply.

Vesicular breathing is most frequent. There may be, however, in any type of breathing, in-

cluding the so-called absent breathing with no air entering the alveoli, or the breathing which characterizes emphysematous conditions. When bronchial breathing is present, it seldom, if ever, has a nasal quality. During the examination of an infant a change of position sometimes causes different percussion and breathing sounds. The spleen and liver may be enlarged because of a passive congestion. The right side of the heart may be enlarged. The more serious cases attended with collapse and particularly those with subnormal temperature have a slow pulse from 70 to 90.

The following table, based on cases confirmed by necropsy, show the relative infrequency of occurrence of the symptoms and signs used in diagnosis.

Cases which showed a feeble infant with a weak cry, dusky color, drowsy and cold were classed as positive. Those classed as negative had none of these symptoms; cases classed as suspicious had one or two.

Physical signs were classed as positive, negative or suspicious, on the basis of the physical examination of the chest alone. Some of these cases were too feeble for examination; cases that had not been in the hospital 48 hours were excluded.

TABLE SHOWING CASES OF CONGENITAL ATELECTASIS CONFIRMED AT NECROPSY.

BASIS OF DIAGNOSIS	PER CENT.		
	Positive	Negative	Suspicious
Signs*	12	46	32
Symptoms	22	35	43

* Ten per cent. (seven cases) not examined because too feeble. Of the above, 20% did not present any signs or symptoms indicative of the diagnosis. Nine per cent. of the cases had both signs and symptoms positive.

Although the above table shows far too few cases, the following two points illustrate:

1. That diagnosis is made more frequently on symptoms than on physical signs.
2. Over half the cases examined, no evidence of congenital atelectasis was found by physical examination of the chest.

The x-ray has been a great help in detecting congenital atelectasis. In about half of the cases in which it led to a positive diagnosis, there was practically no sign or symptom suggestive of atelectasis, although the cases in which it was used are not sufficiently numerous to warrant safe conclusions. We recall few cases where the necropsy finding showed atelectasis in which the roentgenogram, when made was not recorded as suspicious or positive. Tuberculosis, thymic enlargement and pneu-

monias are the most common conditions to be considered in the roentgenogram. Improvement clinically shows corresponding improvement in the x-ray plate.

ROENTGENOGRAM

The roentgenogram very often shows a broad shadow at the hilus, sometimes extending down to the diaphragm, with irregular, small and large patches near the hilus, which at times have the appearance of blotches, rarely clear cut and sharply defined. The peripheries of the lungs are usually clear. The emphysematous parts of the lungs are denoted by general increase in radiability. Occasionally the roentgenogram will show a shadow consistent with enlarged thymus but on close inspection tiny patches of lung tissue can be detected within the shadow of the remaining area of the lung. (Note figures 1 and 2;—two cases of congenital atelectasis proven by autopsy.)

PROGNOSIS

The prognosis as regards life depends on how early the diagnosis is made, the underlying cause and the response to treatment. The mortality of our hundred hospital cases was 82 (65 of which an autopsy was performed and the diagnosis confirmed). Of the 18 cases discharged, 8 died within eight months after discharge. It is not sound to consider the mortality of average hospital cases as a basis for prognosis since hospital cases represent a select group of the more serious type.

If the diagnosis is made before three months of age and there is no explainable cause, then the prognosis is fairly good as far as life is concerned. After three months nature apparently does not attempt to inflate atelectatic lungs. A case has been reported in which the autopsy of a fifty-eight year old man showed congenital atelectasis.

PROPHYLAXIS

Congenital atelectasis is often preventable if mothers would see to it that their infants are made to cry in the earlier weeks of life. Occasionally the blame may be laid at the door of the attending physician who neglects to see that the baby cries sufficiently. Crying is the only source of exercise in the first days of life. It is not cruel, if the baby does not cry, to make it cry. If this single measure were properly instituted there would be fewer cases of congenital atelectasis.

TREATMENT

Any treatment that will cause the infant to breathe more deeply should be instituted, provided of course, that it does not result in too great expenditure of the infant's energy. Spanking of the buttocks, which causes the baby to cry and continue to cry, should be practiced at least four times each day. Alternate hot and cold plunges as performed in asphyxia of the new-born are useful. Care should be taken to begin and end with warm water. The shock is important and the change should be sudden enough to cause the infant to gasp. Drops of ether or cooled water poured on the nape of the infant's neck, while in a warm bath, will usually be sufficient to produce rapid and deep breathing. The chest may be briskly wiped with a cool cloth. Stimulation of the cutaneous nerves, by the application of cold, causes deep inspiration even in adults.

Some babies do not react very well to the above measures; in such instances it seems wiser to omit treatment. These infants are usually delicate and feeble and atelectasis is here only one symptom of the impaired vitality. The efforts should be directed towards increasing the baby's vitality by good hygiene and proper feeding.

The general hygiene is most important. The infant should be kept warm or be placed in a warm room containing sufficient moisture. Breast milk is almost a necessity; it may be given diluted with water or whey proteid at first. Infants who are too feeble or become too easily exhausted to nurse should be fed with a Breek Feeder or even with a medicine dropper. If breast milk is not available, a weak formula with a whey proteid is preferable. It seems advisable to feed these infants less food at each feeding but to feed them more often. The infant should not be allowed to lie in its crib in one position but should have its position changed as often as practicable. Every care should be taken to obtain the maximum amount of breathing with the least amount of expenditure of the baby's vitality. Sometimes much better results are obtained by directing treatment to the general condition than local measures directed to the expansion of lungs.

For the attacks of cyanosis, such stimulation as oxygen inhalation, cutaneous stimulation should be given. Artificial respiration should be performed if there is no response.

In some cases treatment seems of no avail; in others, the results are most gratifying. Treatment seems especially helpful in infants under four months.

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CALCULUS IN THE SUBMAXILLARY GLAND

By FREDERICK SHERMAN HOPKINS, M.D., SPRINGFIELD, MASS.

THE infrequent occurrence of calculi in the submaxillary gland and the comparative frequency with which they are overlooked, justifies the report of a case with some account of the characteristic symptoms. With the aid of the Surgeon General's Library I was able to obtain records of only twenty cases of calculus in the submaxillary gland while over three hundred cases of sialolithiasis have been reported. Although the symptoms and course of a calculus in the gland are very similar to those of its more common site, Wharton's duct, this discussion will more particularly concern the former.

History.

The first reported case of calculus in the gland was that of Puzey,¹ presented to the Liverpool Medical Institution in 1883. This was a woman with a history of tuberculous lymphadenitis, and the submaxillary gland was excised as tuberculous. On opening it it was found to contain a large branching calculus weighing 115 gr. Most of the reported cases come from France, and it was there in 1910 that the x-ray was first used as an aid in its diagnosis.^{2, 4}

Etiology.

The etiology of salivary calculi is not definitely established though several factors are probably involved. Bacteria have been found in all calculi where a careful examination has been made,^{5, 6, 7} and seem to play an impor-

tant part in their formation. The fact that most of the cases have occurred in those with a previous history of some mouth infection⁴ lends added evidence to this theory. Foreign bodies have also been frequently reported such as bits of dental tartar, small seeds, bristles and straw, but this has been only in cases where the calculus was in the duct. The lithemic diathesis may also be a factor. However, microorganisms are definitely the important element in etiology, and mouth hygiene is the only aid in prophylaxis.

Description of Calculi.

The calculi vary greatly in size. One removed from the gland and reported by Jones,¹⁰ weighed 9.4 grams, and still larger ones have been found in the duct. Those in the duct are usually oval while those in the gland are frequently irregular or branched in shape. They are sometimes, though not invariably, made up of distinct lamellae. The most common chemical constituents are the carbonates and phosphates of calcium and magnesium together with organic matter. The consistency varies considerably, though they are usually hard and occasionally brittle.

Symptoms.

The symptoms of submaxillary calculus are primarily those of obstruction to the discharge of saliva. Intermittent swelling of the gland is practically always present and may be noticed for many years without appreciable pain. Wharton's duct may also be swollen though usually only when it is the site of the calculus. Ordinarily swelling and pain coincide and are induced by food, even the sight or odor of it being sometimes sufficient. This severe pain in the submaxillary region is relieved by a discharge of saliva which sometimes occurs with considerable force. The pain is usually less severe and less constant when the calculus is in the gland than when it is in the duct. The patient often reports a discharge of blood and pus under the tongue. The latter is, of course, the result of abscess formation, and in these cases there is very severe, excruciating pain until the abscess ruptures. This usually takes place into the mouth though it occasionally breaks externally. If it perforates the skin a persistent fistula may result. Extensive cellulitis may follow abscess formation. There is frequently pain or

difficulty in moving the jaw or in swallowing. Dryness of the mouth is often noticed.

Examination reveals an enlarged and tender submaxillary gland. The floor of the mouth, particularly at the orifice of Wharton's duct is usually inflamed, and blood or pus may sometimes be expressed. Palpation may reveal a cystic swelling or even the calculus itself. The gland may be firm as a result of round cell infiltration and fibrosis. Blair suggests exploration with a hypodermic needle simultaneously injecting a local anaesthetic so that if readily accessible, the calculus may be immediately removed.¹¹ By the aid of a filiform whalebone bougie the duct may be probed and the calculus identified. A good roentgenogram is of great aid in confirming the diagnosis.^{4, 12}

Differential Diagnosis.

The vast majority of the reported cases of submaxillary calculus have been at first wrongly diagnosed. The most frequent error is to accuse the teeth, and many have been extracted for supposed alveolar abscess before identifying the real nature of the trouble. This should easily be done by the intermittent character of the pain which is induced by food and by the swelling of the submaxillary gland. Some of the other false diagnosis that have been made are suppurative lymphangitis, tuberculous adenitis, carcinoma, and tumor of the jaw. Syphilis, actinomycosis, and Ludwig's angina might also be sources of error. Any of these can be readily excluded, however, by careful history and examination.

TREATMENT

The only treatment of salivary calculi is surgical removal. Those in the duct should be removed through the mouth with the aid of local anaesthesia. Exceptions to this rule are sometimes made when the calculus lies in an external abscess cavity or when there is an external fistula leading to it. Most authors also advocate external approach whenever the calculus is in the gland itself, and if there is considerable infection or multiple calculi, removal of the entire gland.^{14, 15}

CASE REPORT

The following case shows a few features somewhat different from those previously reported:

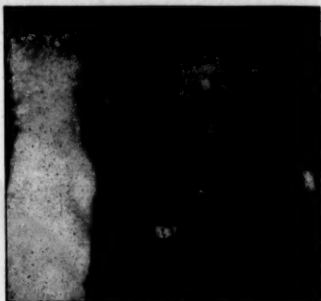
J. K., aged 37, reported to Dr. F. E. Hop-



ROENTGENOGRAM OF CALCULUS IN SUBMAXILLARY GLAND.

kins, June 12, 1920, with a history commencing four years previous with occasional painless swelling on the right side of the floor of the mouth. Within a year there developed right submaxillary swelling and toothache-like, non-radiating pain, both of which were so greatly increased at meals that he was sometimes unable to eat. At first there were periods of about a month of freedom from symptoms. After two years of this course he suddenly developed very severe pain and increased swelling of the gland. He consulted a specialist who told him it was either tonsils or teeth, probably the latter. An ointment was prescribed and used. For five days he was unable to sleep, and could not swallow. Then the abscess ruptured into his mouth discharging a "half cupful of pus." It drained freely for a week. Since then it has continued to discharge a small amount of pus and has felt like a tooth-ache. Two normal teeth were removed. About a month after the spontaneous evacuation of the abscess, the increased swelling of the gland at meal times ceased, though there has been constant pain with occasional exacerbations.

Examination showed an emaciated man with a right submaxillary gland which was about 2.5 cm. in diameter, tender, very firm, and slightly irregular. There was a hard prominence on the buccal aspect about 1 cm. in diameter. A fistula from the gland was discharging thick, light yellow pus into the mouth. Dr. F. E. Hopkins made a diagnosis of submaxillary calculus and sent the patient to Dr. H. W. Van Allen for x-ray confirmation. The plate shows the calculus very clearly, especially when viewed stereoscopically.



ROENTGENOGRAM OF CALCULUS IN SUBMAXILLARY GLAND.

Operation was advised but postponed until fall for the patient's convenience.

He was then referred to me for operation which was performed under ether anaesthesia, September 7, 1920. An incision 3 cm. in length was made in floor of the mouth over the right submaxillary gland. With the aid of blunt dissection the gland was approached and entered, exposing the calculus, which extended into several branches. It was so brittle that when grasped with forceps, it broke into several pieces. These were removed, and the cavity was irrigated with salt solution. One catgut suture was used at the end of the wound for partial approximation.

The calculus was about 1 cm. in diameter, pale buff in color, brittle, and built up of granules about 0.5 mm. in diameter, giving it a mulberry appearance. The report of the chemical examination made by Dr. G. L. Schadt was calcium oxybate.

On the second day after the operation, the wound became sore and a little pus was expressed. In order to keep the wound clean and to prevent superficial closing, it was found necessary to irrigate it daily for ten days. The wound was then healed, no pus could be expressed, and the gland was not tender. For nearly two months he had a slight burning sensation on the right half of his tongue, though the sensation of taste was entirely normal. An interesting feature of this was that the dilute acetic acid used in testing the sense of taste temporarily removed the burning sensation. For the same period there was occasional aching of the gland especially when chilled. He reported that sometimes a little blood came into his mouth until five months

after the operation, yet none was ever seen at examination, and the floor of the mouth has appeared normal since the third week. Now, eight months after removal of the calculus, he feels entirely well, having had no symptoms referable to the submaxillary gland since three months ago. At that time he had gained thirty pounds in weight and proportionately in strength. Examination is entirely negative except that the right maxillary gland is about 25% larger than normal.

Comment.

The history of this case is typical both in symptoms and in the condemnation of teeth as the supposed cause of trouble. The calculus itself is unusual both as to its mulberry appearance and as to its chemical composition, namely, calcium oxalate. The temporary disturbance of sensation of one side of the tongue is of interest and probably indicates a traumatism of the lingual nerve at the time of operation. The occasional discomfort and appearance of small amounts of blood after operation were probably due to a mild residual infection.

Approaching a calculus lying within the gland through the floor of the mouth instead of by the external route is contrary to the reported methods. The disadvantages of the internal approach are increased technical difficulty, possible injury to the lingual nerve, and lack of dependent drainage of a probably infected cavity. These are, however, easily overcome by care at operation, by leaving the wound wide open, and by postoperative irrigation. The advantages of this method are the avoidance of an unsightly scar and of a possible persistent external salivary fistula. It seems to me that the internal route should be the method of choice.

SUMMARY.

The feature which needs emphasizing is the importance of considering the possibility of salivary calculus in cases complaining of pain in the mouth, teeth, or jaws. The characteristic symptoms are swelling of the gland and pain induced by food. The diagnosis may be confirmed by roentgen ray examination. The treatment consists in removal of the calculus, preferably through the mouth.

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WEEK'S DEATH RATE IN BOSTON.—During the week ending September 17, 1921, the number of deaths reported was 167 against 178 last year, with a rate of 11.50. There were 31 deaths under one year of age against 26 last year.

The number of cases of principal reportable diseases were: Diphtheria, 20; whooping cough, 6; scarlet fever, 12; typhoid fever, 3; measles, 9; tuberculosis, 41.

Included in the above were the following cases of non-residents: Diphtheria, 1; whooping cough, 1; scarlet fever, 1; tuberculosis, 11.

Total deaths from these diseases were: Diphtheria, 2; measles, 1; tuberculosis, 11.

Included in the above were the following non-residents: Diphtheria, 1; tuberculosis, 1.

THE MASSOTHERAPOR FOR EAR AND NOSE TREATMENT.*

BY JAMES TAYLOR, JR., M.D., WORCESTER, MASS.

AN instrument which will furnish an effective, safe and inexpensive method for the relief of many acute and chronic cases of ear and nose, in the hands of the physician, whether specialist or general practitioner, is important. Probably 95% of such cases seeking medical relief are first seen by the general practitioner, and later, if not relieved, referred to the specialist. These early days are crucial and full of suffering. Generally disguised as coryza such cases, if neglected, lead to chronic conditions so familiar to specialists. Passages filled with infected mucus or muco-pus should be drained and the mucous membrane relieved of its engorgement, by creating a vacuum in such cavities by suction or deflation. (The term suction in this article is used synonymous with deflation.)

The writer's method permits of suction and inflation by a hand instrument with a special

* Read at the Worcester District Medical Society, Feb. 9, 1921.

valve, which is readily operated for either condition and by the same method.

Aural inflation, whether by catheter or Politzer bulb, is the main reliance of the physician in acute ear treatment, but also feared as a possibility of increasing pain and infection by blowing secretion into middle ear, and with the increased pressure adding to the pain. The cilia of the eustachian tube are trying to whip into the naso-pharynx such secretion, fulfilling their function. Inflation, then, in these conditions is wrong, unless preceded by suction, and then merely to restore the normal pressure.

In non-inflammatory deafness, Professor Lucae of Berlin, emphasized the pressure of the ossicles inward as in suction, by the use of a special spring probe against the short process of the malleus. Ballenger calls the Lucae method *par excellence* in adhesive deafness, if the pain can be eliminated.

When we consider the anatomy of the malleo-incudal joint, which yields only outward on inflation, but when drawn inward as in suction moves (together with) the incus and the stapes, suction does seem a rational method of ear treatment. When a physician has tried the method on himself he will find it much simpler in giving instructions to patient, and will find his enthusiasm awakened by the possibilities of deflation or suction.

In children, this method reaches its true field. No special system beyond fitting the nasal bulbs to the child, and compressing the bulb two or three times, whether suction or inflation is desired. No shock, or blast, a gentle but effective movement with little or no fright, with the right operation of the instrument. It allows of the most delicate or the most intense application at the hands of the operator.

The massotherapor is made of tempered metal in ten parts, each carefully threaded together and nickeled. It is practically unbreakable in ordinary use, readily sterilized and adjustable to an individual. It is provided with:

1. Nasal bulbs readily adjusted to any size and width of introitus.
2. The mixing chamber of sufficient size and form to mix the air and medication without allowing too heavy a mixture to be sent to nostrils or weaken too quickly the air pressure. By heating the chamber over a bunsen burner, hot air may be used in treatment.
3. The reservoir for the medicated preparation. This preparation enters the mixing

chamber where it is met by the air from the bulb, mixed and carried forward to the nasal bulbs and through the nasal passages.

4. A rubber bulb and tube attached. The bulb is firm and resilient and fills the hand comfortably. The tubing is of pure gum, cloth wrapped and non-kinkable. It may be attached to any suction pump, if severe action is sought.

5. The valve which allows of instant change from suction to inflation has for its base the usual ball valve. Adjusted to this is a screw cap with a cone at 60° which fits accurately the air intake at the same angle. The screw cap has four openings around cone which allows free air to the ball at base. As cap is turned, inflation results when outward; or suction when turned fully inward. Any grade of these movements may thus be secured. With valve adjusted for suction, a vacuum is created by operating the bulb as described, with resulting discharge from cavities into air passages.

6. The instrument is made ready for sterilization by removal of tubing and bulb and reservoir.

How to Use the Massotherapor.

First: Adjust the nasal pieces to the orifices, so that the patient *cannot blow past them*. Although made of tempered metal, they are readily adjusted by shaping with the hands to the exact angle of the nasal orifices, and should hug well the septum. Now, if rightly fitted, point nasal bulbs to the part to be treated; along floor of nasal fossa, for eustachian tube; to middle meatus for maxillary antrum; almost directly upward for frontal sinns.

Second: Adjust the valve to the desired grade of suction or inflation, then follow the three most common methods used in Politzer's inflation.

(a) Politzer's method. The patient takes a little water into his mouth and the bulb is pressed while swallowing.

(b) Lucae's method. The bulb is compressed with the sounding of "ah."

(c) Gruber's method. Root of tongue back with a forcible expiratory effort. Or sounding the "hk" sound in hak, hik, hok, huk, with emphasis on the "k."

Writer's method. The patient, after deep inspiration, forcibly inflates the buccal cavity with lips tightly closed, with tongue well back, as if swallowing. Repeat a few times, till satisfied, testing the pressure of the inflated cheeks.



SECTION OF MASSOTHERAPY IN FRONTAL SINUSITIS. WRITER'S METHOD.

Then, with the instrument perfectly adjusted to the nasal orifices, alternate the compressing and the releasing of the bulb, till the desired result is obtained. By distending cheeks the naso-pharynx is closed and the column of air in nasal passages is compressed or rarefied, with the action of bulb.

In children and in many adults no particular method is needed beyond mouth breathing, while using instrument.

If single bulb action is desired, close the other nasal bulb with any adhesive substance.

Air may be more or less restricted to one tube only if Gruber's suggestion is followed, *i.e.*, have the patient bend his head toward one shoulder, the air then is forced to enter the middle ear on the side turned away from that shoulder.

Points of Emphasis.

1. It is self-applied, and can be used by any patient after instruction, should the aurist so desire.

2. The nasal bulbs are universal and are mechanically adjustable to any nose. Success or failure is dependent on this adjustment.

3. Inflation or suction is under the complete control of the operator of the bulb, affording weak or strong movement without blast or shock.

4. With the operation of the massotherapor, the aurist may witness the movement of the



SECTION OF MASSOTHERAPY IN FRONTAL SINUSITIS WHILE PATIENT IS MOUTH BREATHING.

ear drum outward and inward. The tympanic membrane cannot be stretched by its use, for the proper adjustment of the valve will prevent it.

5. Secretion may be drawn from sinuses, eustachian tubes, middle ears, etc., and also effective massage brought about with such cavities, the naso-pharynx and turbinates.

Its operation dismisses all danger of blowing infected mucus into the middle ear.

6. It carries a medicated preparation which may be fluid or non-fluid, as operator prefers, and is controlled by the air bulb and turning up the shell of reservoir.

7. All parts (10) are threaded to the whole. No slip joints, pressed metal, solder, or easily fusible metal. It is hand-wrought and may be heated to red heat without losing its efficiency.

CASES.

While the massotherapor has been used in crude form for a number of years by the writer, four recent cases are selected to show how effective in its present form, it may be, in the hands of the medical profession; on cases which have had no previous experience.

CASE 1. A. D., acute otitis media; A. S., acute otitis media with simple mastoiditis.

E. E. F., thirty years old, married, two children. Came to me on January 3rd, referred by Dr. D. He gave the following history: Caught cold on Tuesday, December 27th. On Decem-

ber 28th, left ear began to pain and continued to increase until December 30th, when ear discharged, with relief of pain. Right ear had been paining for twenty-four hours and had become quite severe. Discharge of left ear ceased within a few hours and pain returned. Both ears were now paining severely, on December 30th, when he went to see Dr. R., his family physician. Was given some pills for the pain. Felt very much better after taking the medicine, but the dull pain back of left ear was still troublesome. Next day, December 31st, pain had increased in both ears. Telephoned to Dr. R., who was out of town for a few days, and was referred to Dr. D. Saw him on Sunday afternoon, January 2, 1921, who referred him to aurist.

Patient seen by me on Monday morning, January 3, 1921.

Examination—Patient looks ill. Of average height, well nourished, temperature normal, pulse, 72. Presents left ear for examination without instructions. A. S.—Crusted secretion in canal, no fluid, considerable hyperaemia over canal, with slight swelling of the superior posterior wall of canal. Outline of m.t. gone, short process barely seen. Black crust on superior posterior quadrant of m.t., no discharge or pulsation. Mastoid quite tender, patient cringes on pressure, slight oedema, some tenderness over zygoma, tenderness in muscles of neck. A. D.—Bulging m.t., scarlet red, outline lost, short process evident. No swelling of canal, hyperaemia extending around m.t. to canal. General tenderness above, back and below ear. No special increase on pressure.

Nasal Examination—Considerable general mucopus throughout nasal passages. Slight spur in left nostril, enlarged turbinates, vessels prominent, free frontal secretion. Caution of turbinates with equal parts of nitric, hydrochloric and acetic acids.

Ear Tests—Hearing in left ear is diminished, whispered voice heard at $1\frac{1}{2}$ ft.; in right ear at four feet. Tuning fork 64 not heard in left ear. Heard for three seconds in right.

Treatment—In this case paracentesis would be ordinarily indicated. Explained the massotherapy to patient, who consented to its use. Pure suction was followed for fifteen minutes, bulging of m.t. was noticeably decreased in both ears with less pain. Patient allowed to rest for fifteen minutes and suction again practiced for ten minutes, with short rest intervals. Mixed suction and inflation for five minutes with no increase of pain or distention of m.t. Patient given carbol-glycerine 10% to use in ear if pain increased. To report at 8 P.M. by telephone. Reports at eight, that pain has not increased, and while not comfortable, thinks there is no need of using drops.

January 4th. Patient, on examination, shows bulging of right m.t. gone and in left ear less distention. Still some pain in both ears

at intervals. Less pain on pressure of the mastoid of the left ear. Pain around right ear has disappeared. Hearing has improved, whispered voice now heard in right ear at ten feet. Left ear at four feet. Ear tests made after suction and inflation was followed somewhat similar to previous day. Patient has shown so much improvement that I have decided to omit daily visit.

On January 6th, he returns, stating that all pain is gone in right ear; occasional twinges in left ear.

January 10th. Quite an area of m.t. has cleared in right ear. Left ear bulging gone, less hyperaemia. After suction and inflation, patient says he hears almost as well as normal. Pain is absent, pressure on left mastoid is borne readily.

On January 14th, right ear is practically clear, with no retraction; left ear is slightly retracted. On examination after treatment both m.t.s. are apparently in normal position. Left ear has considerable hyperaemia. Patient says his hearing is as well as ever. Has had no pain or discomfort. Complaints of nostrils being stuffy. Given treatment for this condition.

CASE 2. Acute inflammation of the frontal and maxillary sinuses.

T. I., 51 years old, married, five children, had been under care of Dr. S at irregular intervals for three months. He was referred to me on December 18, 1920, and gave the following history:

He had a severe cold three months ago, followed by an ear ache on the right side, and frontal disturbances on the same side. Usual symptoms of coryza; blows considerable secretion of a thickened type from the nose during the day. Lately, there has been persistent dull pain over frontal and maxillary sinuses. Believing that his teeth were troubling him, he saw Dr. Tyler, dentist, on November 17th, who found very little the matter with the teeth; thought it wise to have x-ray taken. This was done by Dr. Ernest E. Smith. Plate showed slight infection in the right third upper molar tooth, so slight that Dr. Tyler said he would not remove it if it was not for the severe symptoms of patient. Tooth was removed, small point of infection found. However, patient continued to have same pains in ear, frontal and maxillary, and was again referred to Dr. Smith for x-ray of frontal and maxillary. Dr. Smith made the exposure and found an involvement of the right frontal and maxillary sinuses, and Dr. Smith referred the patient to my office.

Examination of right nostril showed enlarged turbinates with congested blood vessels, bulla ethmoidea was quite prominent and anteriorly covered with crustation. A little mucopus was apparent in the infundibulum. Inferior turbinate showed considerable crustation with two small areas of ulceration. Nose was

thoroughly cleansed, turbinates with the bulla ethmoides cauterized and suction applied. Suction gave very good results and there was an increased flow of secretion which was quite globular in character. I continued to use suction till the secretion was tinged with blood. Patient felt this suction in ear and said that the pain was easier. I gave the patient local treatment for nose, nasal ointment, and douche of sod, bicarb. one dram to quart to use every four hours, and to report on the following morning.

December 19th. Patient reports pain easier in frontal and maxillary. I gave carbol-glycerine 1-10 to use in ear for pain. Patient had used this. I followed same treatment as on previous visit, with relief. Saw him two days later and the pain in frontal had decreased.

One week later (December 26th), the maxillary and frontal pain had entirely disappeared. Same treatment was followed, that of suction with slight inflation. During these sessions, I treated right ear as adhesive catarrh. Pain was evidently due to toxic absorption somewhat dependent on the sinusitis of frontal and maxillary, and seemed to be centered largely in the glenoid fossa and ossicles. Slight redness of Shrapnell's region and the superior posterior and inferior areas of external ear were somewhat tender to touch. Glenoid joint sensitive on movement. Gave patient instructions to keep ear thoroughly packed with cotton and apply heat to exterior. Ear has continued to improve. Saw him on December 31st, January 4th, 11th, 18th. Reports on the 18th that he has had three days in which he has been entirely free from any form of pain. Maxillary and frontal pain has not returned in three weeks but he still has some pain in glenoid fossa on eating. Hearing is gradually returning although he still has difficulty in getting voice sounds at ten feet. in the right ear.

CASE 3. A. U. Aente otitis media.

K. W. S., five years old. Mother says child not well for two weeks, lack of appetite and less active.

January 15, 1921, temperature 101. Called Dr. B., family physician, who directed treatment to bowel trouble.

January 16, temperature 98.6, and continues to improve. Bowels still troublesome.

January 19, temperature 101.2. Patient complains of ears, throat and neck. Treatment directed to throat.

January 20, patient restless at night; complains of pain in ears, left ear more painful. Eardrops, carbol-glycerine 1-12. Temperature 102.8.

January 21, Dr. B. refers the case to aurist. Saw the case about noon. Nurse in attendance—4-hour chart. Temperature 101.8. Patient looks ill, restless, complains of ears and neck.

A. D. Membrana tympani grayish red; fair

outline, but rather full. No tenderness to mastoid or right side of neck.

A. S. M.t. scarlet red, poor outline, bulging posterior half upper and lower quadrants. Shrapnell's membrane, more distention than membrane tympani proper. No tenderness to mastoid, but some tenderness below ear in neck muscles.

Throat—Tonsils not enlarged, and crypts free. Some hyperaemia to anterior and posterior pillars. Nose—Considerable mucus. Swollen turbinates. Eyes—Some lachrymation with slight crusting in morning. Naso-pharynx—Medium adenoid tissue, and deep scarlet. Mucopurulent secretion over nodules. Fossae of Rosenmuller well filled with adenoid tissue.

Treatment—Family dislikes paracentesis or adenoid operation, unless necessary. Used massotherapy with coöperation of little patient, valve adjusted for suction, 10 minutes at intervals. Less tension to m.t. in both ears. Temperature continues to fall till at 4 p.m., it is 99.8. Patient has comfortable night. No drops used.

Saturday, January 22, saw patient at 8.30 a.m. Temperature 99.6. Bulging absent in lower post quadrant of A. S. Applied suction for ten minutes, and slight inflation for one minute. At 11 a.m., temperature rises to 102, and continues to 102.4 at 8 p.m. Instructed to use ear drops and ice bag. Slight vomiting spell,—mucus.

Sunday, January 23, temperature 101. Slight increase of bulging in A. S. Decided to use pure suction without inflation. Yesterday's increase of symptoms may have been due to inflation. Suction applied for ten minutes. Child is wonderfully helpful with the massotherapy; no fright, no crying spells; whimpers a little. At 8 p.m., nurse reports temperature 99.8 and no pain all day.

Monday, January 24, temperature 98.6. Suction applied for ten minutes, at intervals. Child has no pain, neck muscles free, general condition good. Slight swelling in Shrapnell's area. Case left to care of nurse and family physician, to report morning and night to me.

Thursday, January 27, temperature 98.6, and since former visit, no pain. General condition excellent. Up and around room.

CASE 4. A. D. Eff. O. M. P. C. A. S. Eff. O. M. P. C.

J. G., 14 years of age, referred by Dr. M. Patient gives history of pain in ears, discharge occasionally, and poor hearing for intermittent periods for six years. Has had operation for adenoids at three different times. Has heard better after each operation, except the last. Saw patient for first time, June 15, 1920.

A. D. Membrana tympani retracted, with scar on post, infer. quadrant. No perforation. Adhesion in Shrapnell's area. Tuning fork 128

heard for three seconds, whispered voice at three feet.

A. S. Membrana tympani much retracted, malleus angular and sharply prominent. Calcic deposit anterior and near umbo. Tuning fork 128 just heard and whispered voice at two feet.

Nose—Enlarged turbinates, and spur in left nostril. I cauterized turbinates with dichloroacetic acid. Naso-pharynx—Tufts of adenoid tissue in fossae of Rosenmuller. Tonsils—Small and nodular.

Treatment—Applied suction and inflation at equal intervals, every week for three weeks. Mother says much improved for a few days after each treatment, and then as deaf again. Instructed mother and patient in use of massotherapor, and loaned it for daily home treatment; also gave a nasal ointment.

July 27, patient reports. Tuning fork 128 heard for five seconds in both ears; whispered voice at eight feet. Advised home use of massotherapor twice a week.

September 8, patient hears readily; retraction of m.t. much less; whispered voice at ten feet.

November 9, mother says hearing is all right, patient is speaking better, and has no colds, and has improved in school work. Retraction absent in the right ear and much less marked in A.S. Massotherapor now once a week at home.

January 29, 1921, patient reports "hearing everything." No retraction and general appearance of ear drum very satisfactory. Voice and tuning forks seem normal.

This may help to illustrate what home use may do under the guidance of the physician.

Dr. E. A. Crockett and Dr. George A. Leland of Boston have sent for this meeting very favorable opinions of the massotherapor, which they have had for a number of weeks. (letters read.)

As this paper has been written largely for the benefit of the general practitioner, who usually first sees acute cases, no attempt has been made to take up the various types of chronic deafness, mastoid and other purulent conditions of ear and nose, which field belongs largely to the specialist.

Clinical Department.

LEAD PENCIL LESIONS.

By FREDERIC J. COTTON, M.D., BOSTON.

It is the odd similarity of these cases that impels me to put them on record. That the useful pencil, like the frivolous hatpin, may become a dangerous weapon, we have long known.

It is only because the nature of the wound



FIG. 1.—X-ray of Case I, three weeks after injury, taken by Dr. A. W. George, showing the lead marker and the unmistakable lead-pencil triple outline.

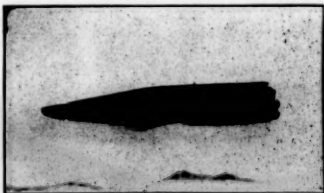


FIG. 2.—Lead pencil fragment removed from thigh in Case I.



FIG. 3.—Case II (x-ray, P. F. Butler). This is only the corrugated metal cap of the pencil and the rubber end, heavy with sulphur which "takes" in the picture. Some wood of the pencil stem was present, but does not show.

and its cause were so long unrecognized in both these cases that they gain a certain interest.

J. B. C., then a small girl of nine years of age, running, late to dancing school, felt a sharp pain near the left knee. There was a wound, and she went to a doctor near by, who put on a dressing. For three weeks she went about work and play, active, but unhappy, and showing, throughout, an amount of lameness and of nervous upset out of proportion to the wound, which wound everyone supposed had been made by a foolish little dance-program pencil that was dangling from her belt. After three weeks an x-ray was taken. Figure 1 tells the whole story! The pencil fragment shown in Figure 2 was removed; the wound healed promptly, and that is all, save for the scar.

B. C., aged 34, got into an "argument" and got punched a "couple of times." Some weeks later he was sent to me by Dr. N. N. Levins, with an incomprehensible tumor of the face. There had been a trifling wound near the chin, long since healed. Naturally, I assumed an infective origin of the tumor, sent him into the hospital, opened up inside the mouth, and found no adequate cause for the massive infiltration, nor was there any delay in the closure of the wound. I had ordered an x-ray at the hospital but, as sometimes chances, no plate was forthcoming. He reported to me at the office five days later, and it was evident that we had not reached the cause of the trouble. Figure 3 shows why. A second operation resulted in removal of the pencil fragment from deep in at the back of the cheek, and, not without a difficult search,—in removal of the rubber eraser end, imbedded more deeply, and that was all of that.

Mr. C. assured me he had no pencil in his mouth or in his hand at the time of the disagreement, nor did his adversary show a pencil,—or any academic tendencies that might imply pencil carrying.

These cases are curious, surely, and give what may become a classic x-ray picture of a dangerous, penetrating weapon, previously unrecorded and unrecognized, so far as I have noticed.

The New England Surgical Society

PRESIDENT'S ADDRESS.*

MEDICAL EDUCATION AND THE MEDICAL SUPPLY.

By JOHN M. GILE, M.D., HANOVER, N. H.

EVERY occupation is interested in the means by which its members are recruited. In other

words, in the method of education by which it is perpetuated. In the case of the medical profession the public is likewise, directly, though perhaps unconsciously interested. Their interest is in having an ample supply of well trained men, if it is an oversupply so much the better. The members of the profession may desire to consider the means of keeping the supply at a fair average, and so may be interested in its limitation as well as its production.

It may be of value to review for a moment something of the history of medical education in America and to consider briefly what the supply is at the present time and what its prospect is for the future.

Someone has said that the chief recreational exercise of an old man is found in changing his last will and testament. There seems to have been a period in medical education in America when the chief recreation of physicians must have consisted in founding medical schools; and the process was a very simple one, the only requirement was to secure a charter and hire a hall and forthwith a new medical school was in existence. The states appeared to take pride in this multiplication of institutions of higher learning within their boundaries, so charters were secured without difficulty, halls seemed to be abundant and the process went merrily on.

In the northeasterly group of states, the period was, roughly speaking, from 1830 to 1880. In the South and West, it began between 1860 and 1870, and continued until about 1900. The New England states, however, were the least serious offenders in this direction. Massachusetts appears to have had, at different times, eleven medical schools chartered, five of which are still in existence; though, I suppose most Massachusetts physicians are not enthusiastic about the so-called College of Physicians and Surgeons and the Middlesex Medical Institute. Vermont has had six schools organized of which five are extinct. Maine has had three, all now gone out of existence,—the very excellent and substantial school at Bowdoin having announced discontinuance with the close of the last college year. In Connecticut, there has been but one such foundation, the present Yale medical school. Rhode Island, also organized but one, which was for a time connected with Brown University. New Hampshire had three, two of which were apparently stillborn and had no graduates; while the Medical Department of Dartmouth now gives but the first two years of the medical course. New York, on the other hand, has a record of thirty-five medical colleges, twenty-seven of which are extinct. The banner state of the country appears to be Missouri where forty-four medical schools have been organized, six being still in existence. Illinois, Georgia,

* Delivered before the New England Surgical Society at Worcester, Mass., September 21, 1921.

Indiana, Maryland, California, Tennessee, Iowa and Ohio, all run to high numbers.

The northern and eastern states had very largely corrected this ludicrous situation, before the influence of the Council of Education of the American Medical Association began to be felt, but through the south and west the schools above referred to existed in large numbers until the public opinion and legislative action created by the Council, forced them out of existence. At the present time eighty-five medical colleges are receiving and instructing students within the limits of the United States and three hundred and sixty-six have become extinct.

Obviously, such a mortality in these institutions must be having a marked effect on the medical supply of the country. Are we as a result facing a dearth or was the previous condition one of impossible oversupply?

Let us consider the situation more in detail as it relates to New England. Twenty years ago, the New England schools gave the degree of M.D. to three hundred and thirty-three men. In 1920 the existing schools gave degrees to two hundred and twenty-four men; ten of this number were graduated at Bowdoin, above referred to as suspended. This gives us thirty-two per cent. less of medical graduates in 1920 than in 1900. The medical supply of New England, however, has in the past been drawn in large measure from New York and Maryland. In 1900 these two states gave medical degrees to something over nine hundred men, in 1920 they gave but six hundred and forty medical degrees, very close to the same percentage of decrease as had occurred in New England.

It was apparently expected by those who were urging the discontinuance of many of the schools that those remaining would materially increase their output of graduates. A report of the Carnegie Foundation advocated that the medical departments at Harvard and Yale Universities should supply all the medical men needed in the New England States, but these schools have not felt that it was wise to greatly increase their student numbers. They have, in fact, limited them to a smaller number than formerly, with the result that in 1920, these two schools graduated but one hundred and fifteen men; very obviously a number that would fall far short of taking care of the medical necessities of New England.

Contemporaneously with this decrease in the output of medical graduates the population has had a rather rapid growth. The census figures for 1900 gave a total population in New England of five million, six hundred thousand, while in 1920, the figures are seven million, four hundred thousand, an increase of two million, eight hundred thousand. During this time the physicians had increased from ten thousand and eighty-three to ten thousand, eight hundred and six; the percentage of physicians to popula-

tion in 1900 being one physician to every five hundred and fifty-four of the population and in 1920 one to every six hundred and eighty-five of the population.

This latter figure, namely, one physician to every six hundred and eighty-five of the population, does not sound as if there was a lack of medical men. These statistics, however, do not give quite a correct statement of actual conditions. They are taken from the directory of the American Medical Association and many names appear there that no longer represent active practitioners. Some are in other occupations and some, by reasons of age or other physical inability, have ceased practice. Dr. Duncan, secretary of the state board of health of New Hampshire, who has recently made a survey of the medical situation in that state, figures about ten per cent. less active doctors there than appear in the medical directory. If this holds true for all New England, we should decrease our number of physicians to ten thousand and eighty and our proportion would stand 1 to 734 of population.

But even these figures do not present a grave problem. It is the tendency to a change in the distribution of physicians that should make us take thought. In 1900 there was in Boston one physician to every 325 of the population and in 1920 the figures stood one to every 350 of population. A change of very slight importance; but in the more northerly of the New England states, Maine and New Hampshire, the proportion in 1900 was one physician to 530 of population while in 1920 it was one to 700. In New Hampshire, there had been an actual decrease of 100 in the number of physicians, with an increase of something over 30,000 in the population.

In the large rural districts it is very difficult to give a proportion between physicians and population that will indicate the actual fact, the over-lapping practice from town to town making figures unreliable. There are certainly, however, large areas in which the populations run as high as 800 to each physician and much of this population lives far from the nearest doctor. I know of many flourishing hamlets of considerable size that are distant all the way from ten to thirty-five miles from the nearest physician and, with such distances to take into consideration, it is, of course, much less easy for one man to look after the health of a given number of people than were the same population situated within a radius of a few miles.

A still more significant factor, however, is found in the average age of physicians in different communities. To illustrate, in Boston, the average age is forty-four years and in Manchester, New Hampshire, forty-seven years, while in the small towns in New Hampshire of two thousand population and under, the average age is fifty-two years. This indicates very

definitely where the young men are going, namely to the large centers of population.

With the more stringent educational requirements that are steadily being called for, the average age of all medical men is high and the number of years of active practice is proportionately diminished. But this very high average for the country districts certainly presents a problem, and a problem that is common to all of New England.

These men of an average age of fifty-two, as just noted, are sufficient in number at the present time to control the situation, but that very age indicates how little new blood is coming in to fill their places. These are the men who came to the country districts of New England in the eighties and nineties and the first years of the present century; a time when there were many more medical schools than at present and when the schools still existent were graduating more men than now. They were men who for the most part, went directly from the secondary schools to the medical college, without collegiate training and the medical schools were often mediocre or inferior—certainly very inferior to the medical schools of today, but after long years of constant work with these men, I wish to give my testimony to the generally high standard of ability that prevails among them and still more emphatically to commend their faithful, conscientious attitude in relation to their patients. There appears to be something in the profession that gives keenness of observation and a broad humanity even to men whose preliminary training has been insufficient, and no more valuable or conscientious servants of the public can be found in any occupation.

With this medical group in the country districts of New England, now past an average of fifty years of age, where are to we look for their successors? The young man entering the profession today has had at least two years, and in many instances a full four years, in a college of the liberal arts. He has then taken his medical course in some large city center, and even though he may have been born a country boy, the country and the things of the country have grown dim. The cost of his education has been great, the lure of the city has filled his mind and scarcely a thought of a country practice enters it. While to most men who are city bred the country appears insignificant. The great mass of the city with its dense population looms so large that the scattered dwellers of the country seem unimportant, but we must remember that the men and women of the great open spaces represent the basal industry that is still the great bulwark of our national prosperity and that without them the cities, too, must die. I commend to you Knut Hansun's most recent book, "Growth of the Soil."

The figures we have considered seem to force us to the conclusion that the medical situation

in our country districts will soon be a serious one, and of these figures, the age average is the most significant. Suppose a manufacturing industry should discover that the average age of its employees was fifty-two and that their number, in proportion to the work to be done, was steadily decreasing. We can assume that pretty energetic measures would be taken to find or make a new source of supply. If, in addition to this, the occupation required a high school education and at the very least seven additional years of technical training before any productive work could be done the proposition would look pretty hopeless. Yet this is exactly the situation that confronts us in relation to the rural district medical supply. It is a supply that we cannot go out and recruit from the highways for it requires the longest and most expensive training of any occupation. No short cuts are possible for the law of practically all states demands the minimum mentioned.

There are, it is true, certain offsets that help to compensate for the decreasing number. The automobile enables the man with a widely scattered practice to double or treble the work he could do with horses, but in all the northern half of New England there are four or five months of the year when this method of conveyance is impracticable. The trained nurse may, in some cases, make one call a day suffice where, without her, two would have been necessary. The many small hospitals materially lessen the work in many instances. But none of these things, nor all of them put together, overcome the menace of the passing of the country doctor.

Requests frequently come to the faculties of medical schools to supply physicians for country towns and the State Board of Health of New Hampshire is constantly besought to furnish medical men for such communities. Many of these towns even suggest subsidizing a man if he can be found. This suggestion may be, in fact, a solution of the problem but it carries with it a very undesirable yet probable sequence. If the towns embarked on such a program it would not be long before the question of state aid would arise and thus a long step would be taken toward the socializing of the profession or state medicine, a step that we all believe would be disadvantageous both to the public and the profession.

A point where the state might come in helpfully and without the evil above referred to would be in the more frequent establishment of laboratories outside the cities, laboratories situated at such intervals that the practitioners of the district would actually go to them with some frequency and discuss the laboratory findings with the laboratory man, such a discussion often illuminates a case as no formal report on a printed blank can do. True, this would not increase the actual number of clinical men, but it would give them more time for their

actual clinical work, make them feel that they were more up-to-date, and be in every way an encouragement to better medicine. With the training given in the schools today the practitioner is, of course, supposed to be able to do all of his routine and even some of his rather highly technical microscopic and chemical work, but there is no sadder sight than the so-called laboratory of the busy practitioner. And he is not to be criticised, for the man who has driven with a horse thirty or forty miles on a cold winter day is in no frame of mind to clean slides and test tubes and look with discriminating eye through a microscope. How much do the clinical men here know of the working details of the laboratory? We do well if we can keep pace with its constantly changing technical jargon.

But, assuming increased laboratory facilities, we have not yet solved the problem of the medical supply for the rural districts, and, in some way, the medical schools must find the answer.

The work of the Council on Education of the American Medical Association deserves the highest commendation both from the public and the profession. They have raised our standard of education to a point where we no longer have to apologize for it; but in the process it has become concentrated in the large cities and into relatively few schools. The result of their location is a city trend of the graduates, while the limited number of schools have not, as expected, increased their facilities for the admission of all properly equipped applicants but are making rigid numerical limitations. But even if the existing schools were ready to take all applicants, there is a certain advantage in their more even geographical distribution. Even more than the laboratories they become centres that result in better practice by the physicians over a wide area around them and their graduates are much more likely to consider some outlying country district.

If one of the medical schools of Massachusetts were located in Worcester or still farther west, in Springfield, I believe it would be to the advantage of Massachusetts. The trustees of Dartmouth College apparently have no desire to restore the last two years of its medical school, but New Hampshire would be benefited thereby, while the discontinuance of a school so strategically located and so intrinsically sound as Bowdoin is an educational tragedy.

Restorations or new foundations is the answer to the problem of the rural medical supply. Some views of medical education regard such suggestion as heretical, but the next twenty years will prove the contention valid.

RECENT DEATH.

Dr. LESTER BURNAGE LE GAO, a Fellow of the Massachusetts Medical Society, died at his home in Bradford, August 18, 1921, of diabetes, aged 58. He was a graduate of Baltimore Medical College in 1906, and practiced laryngology, rhinology and also dentistry.

THE RESULTS OF THE EXAMINATIONS OF CANDIDATES FOR MEDICAL LICENSURE IN MASSACHUSETTS IN JULY, 1921.

COLLEGE OF GRADUATION	NUMBER OF APPLICANTS	ACCEPTED	REJECTED
Mass. College of Osteopathy	11	5	6
University of Vladimir	1		1
Middlesex College of Medicine and Surgery	19	11	8
Univ. of Constantinople	1		1
Univ. of Naples	1	1	
Univ. of Maryland	1	1	
Am. School of Osteopathy	2	1	1
College of Physicians and Surgeons, Boston	5	2	3
Tufts College Med. School	60	56	4
Kentucky School of Med.	1		1
Baltimore Medical College	1	1	
College of Med. Evangelists	1	1	
Columbia Univ. College of Physicians and Surgeons	3	3	
Univ. of Southern Calif.	1		1
Univ. of Penn. School of Medicine	1	1	
Long Island Coll. Hospital	1	1	
Medical School of Harvard University	28	28	
Chicago Coll. of Osteopathy	1	1	
Kansas City Univ. of Physicians and Surgeons	1	1	
Boston Univ. School of Med.	8	8	
Univ. of Vermont	1	1	
Jefferson Medical College	1	1	
Phila. Coll. of Osteopathy	1	1	
Bellvue Hosp. Med. Coll.	1	1	
Coll. of Physicians and Surgeons, Los Angeles	1	1	
Johns Hopkins University, Medical Department	1	1	
Univ. of Maryland and Coll. of Phys. and Surg.	1	1	
Emory Univ. School of Med.	1	1	
Detroit Coll. of Med. and Surgery	1	1	
Georgetown Univ. School of Medicine	1	1	
Laval Univ. Faculty of Med.	1		
Quebec	1		1
Univ. of Toronto, Faculty of Medicine	1	1	
TOTAL	160	133	27

The Massachusetts Medical Society

A stated meeting of the Council will be held in John Ware Hall, Boston Medical Library, Wednesday, October 5, 1921, at 12 o'clock, noon.

Business:

1. Nominating Committee nominates and Council elects an orator for 1922, in place of orator elected last May, who cannot serve.
2. Reports of Standing Committees.
3. Petitions for restoration to fellowship.
4. Appointment of delegates to annual meeting of Vermont State Medical Society at St. Albans, October 13 and 14, 1921.
5. Appointment of Auditing Committee.
6. Report of delegation to House of Delegates, American Medical Association.
7. Reports of Special Committees and delegates.
8. Fill vacancies in Committee of Arrangements.
9. Incidental business.

WALTER L. BURNAGE, Secretary.

Boston, September 28, 1921.

THE BOSTON Medical and Surgical Journal

Established in 1828

THURSDAY, SEPTEMBER 29, 1921

Published by The Massachusetts Medical Society under the jurisdiction of the following-named committee:

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Communications should be addressed to The Boston Medical and Surgical Journal, 225 Massachusetts Ave., Boston, Mass.

THE MEDICAL PROFESSION AND HEALTH AUTHORITIES.

In the leading article of the *Journal of the American Medical Association* of the September tenth issue, Dr. John D. McLean, Chairman of the Section on Preventive Medicine and Public Health of the A.M.A., gives a brief outline of the "Imperative need of union of the medical profession and the health authorities." While the general tenor of the article fairly represents the coordinate responsibilities of the practitioner and health officials, some of his statements are crude and narrow. To assert that the success of the future lies in problems which could be solved if we had in the United States a 100% efficient medical profession is as useless a waste of argument as an assertion that we could communicate with Mars if we had a cable connection. Human beings, whether doctors or laymen, are not and will not become perfectly proficient. Therein lies the charm of effort and public health officials, theoretically, and often actually, experts in certain scientific and diplomatic fields, should find enjoyable opportunities in teaching others more or less interested in common tasks. The suggestion that the practitioners should make pilgrimage to the health boards with the purpose of eliminating misunderstandings is

not the human method of solution. The practitioner is often an unpaid health official who contributes much to the state in his reports as well as advice to those under his scrutiny. The employee of the state accepts his position with the understanding that he is to become a teacher, adviser and adjuster, not only to the doctor but in a very large way to the people, and if not endowed with the missionary spirit will fail to accomplish much which is open to him. He should go to the doctor.

The closing statement in Dr. McLean's address is certainly very inadequate and implies the narrower view of early health effort which had a limited horizon, for now progressive health agencies are studying all the fundamental and associated conditions which directly or remotely impair the efficiency of human life. The practice of medicine as applied to those evidently ill is of lesser importance as compared with preventive measures which, dealing with heredity, environment and development, accomplish vastly more in promoting health and happiness. However much we appreciate and extol the blessings of the alleviation of pain and cure of disease, the ordinary practice of medicine is a poor second to preventive medicine, for where curative measures have saved thousands, preventive measures have saved many tens of thousands and also saved suffering and expense beyond human computation.

Illustrations come to mind in the care of milk, especially pasteurization, destruction of flies, general cleanliness of utensils and homes which have all contributed to the great diminution of diarrhoeal diseases of children, a result which could never have been secured through medical treatment alone.

REAR ADMIRAL WILLIAM C. BRAISTED'S NEW OFFICE.

A VERY important advance in the coordination of medicine and pharmacy under the direction of Rear Admiral Braisted is under way through the acceptance of the Presidency of the Philadelphia College of Pharmacy by Dr. Braisted. The plans cover all the fields of pharmacodynamics, the most searching study of materials used as medicines, with the purpose of standardizing the quality of drugs and ascertaining hitherto unknown properties. The value of this work may be anticipated by reason of the efficiency shown by Dr. Braisted throughout his career, and the world is favored in having a man who, although retired from Government work, has the enthusiasm of Pasteur, as well as unusual vigor, which combination will be sure to produce results. As an organizer he has already secured the cooperation of large manufacturing concerns.

The Philadelphia College of Pharmacy is the oldest institution of this kind in this country, having been in existence more than one hundred years, and acting under Dr. Braisted's direction has enlarged the faculty and brought new members into association with distinguished scientists who have made the college famous.

By this enlargement of the function of the college curative and palliative medicine will be extended along scientific lines.

DR. EVERETT FLOOD RESIGNS.

THIS state is about to lose a valued official by the resignation of Dr. Everett Flood, Superintendent of the Monson State Hospital. October first will mark the completion of forty years of service for him in state institutions.

Dr. Flood graduated from Colby University in 1879 and received the degree of A. M. three years later. He graduated in medicine from Bowdoin. His first state service was at the Worcester State Hospital, from there becoming Superintendent of the Hospital Cottages for Children, and for the last twenty-four years has been Superintendent of the Monson State Hospital. His desire for accurate knowledge led him to take post-graduate courses in New York, the University College Hospital, London and the University of Berlin. He is a member of the Massachusetts Medical Society, The Boston Society of Psychiatry and Neurology, National Society for the Care and Treatment of Epileptics, The American Academy of Medicine, The New England Society of Psychiatry and The American Medico Psychological Association.

At the recent meeting of the Hampden District Medical Society appropriate action on the retirement of Dr. Flood was taken and a handsome pitcher was presented to him. A suitable farewell meeting is being arranged by the Hospital authorities and a similar meeting with his former assistants will also take place.

The Department of Mental Diseases will publish a complimentary bulletin which will be in commemoration of his service to the State.

As a physician Dr. Flood has been recognized as an expert and has had the happy faculty of assisting practitioners in dealing with the perplexing problems often encountered in the care of epileptics as well as those incident to childhood. He has occupied the position of president in most of the organizations of which he was a member and has been influential in all of them.

He succeeded in an unusual degree in securing the confidence and affection of his patients. Dr. Flood intends to reside in Boston in the winter and at his summer home in Maine the remainder of the year.

THE DIPHTHERIA SITUATION.

BEFORE Behring discovered antitoxin the diphtheria mortality rate ran from 70 to 75 per cent. in many instances; now it is only 10 to 15 per cent. under antitoxin. This is not a satisfactory condition for in addition to the curative action of antitoxin we now have preventive measures in toxin-antitoxin. We had 441 cases in this state in July and 516 in August. Now that we have effective weapons at hand we ought to be able to reduce the number of cases by more than fifty per cent. Any community which is not employing the Schick test and toxin-antitoxin is not on the forefront of the battle line.

MEDICAL NOTES.

THE GOVERNMENT OF NEW SOUTH WALES expects to introduce legislation for state endowment of motherhood, because of the fact that the colored races are breeding in the proportion of ten colored to one white.

The proposal is to finance mothers with families of over two whose husbands earn less than £6 1s per week, at the rate of 6s per week per child until the amount is made up £6 1s. The whole financing of the scheme can be done for £1,000,000 a year. Part of the money will be raised by a state lottery. The claim is that women must carry on the work of the nation building under more advantageous conditions.

DR. FORREST C. TYSON, superintendent of the Augusta State Hospital and well known in Massachusetts, has demonstrated anew this Summer his prowess at golf. Late in August he was runner-up in an exciting thirty-nine hole contest for the amateur championship of Maine (losing the first place probably only because his ball struck a misplaced telephone wire); and more recently he has won, and for the second time, the championship of the Augusta Country Club whose interests are largely in golf.

DR. FRANK H. WASHBURN and his associate Dr. G. Arnold Rice of Worcester are building a suite of offices consisting of waiting room, consulting room, laboratory and dressing room, on Main Street, opposite their present office.

THE CINCINNATI HEALTH EXPOSITION—This great exposition will be held in Music Hall, Cincinnati, Ohio, October 15 to 22.

One of the most interesting features will be Rural Sanitation day when the U. S. Public Health Service will be represented by Dr. C. L. Lumsden, who will give an address.

An especial effort is being made to induce farmers to attend.

The results of years of study by the U. S. Public Health Service relating to rural health problems will be given.

Especially attention will be given to emergencies which must be met whenever there may be difficulties in securing the services of a physician.

President Harding and Governor Davis of Ohio have endorsed the Exposition.

Drs. Royal S. Copeland, Harvey Wiley, Woods Hutchinson, David Lyman, Frankwood E. Williams and William A. Evans will give addresses.

Moving picture pageants and displays will add to the other educational features.

RECONSTRUCTED MILK from milk powder made by the spray process retains the properties of water-soluble vitamins. This enables one to have a wholesome milk for children whenever the question of contamination may be a source of perplexity.

ONE CAN HARDLY realize that the infant mortality rate for New York City was 273.6 per one thousand born in 1885. The reduction to 81.6 in 1919 and thus far this year to an average of 76 makes New York the record city among the largest cities of this country.

A JOINT MEETING of Hampshire County and Franklin County Medical Societies was held at the Lathrop House, South Deerfield on Wednesday, September 14. Dr. John W. Bartol, President of the State Society discussed matters of a general nature regarding state and national legislation. Dr. Lesley H. Spooner of Boston read a paper on "Neuro-syphilis-diagnosis and treatment." The meeting ended with a general discussion, and a chicken supper was served in the main dining room. Dr. A. J. Bonneville, President of the Hampshire District Society was in the chair.

THE PUBLIC PRESS announces the summary dismissal of Dr. Haven Emerson, medical advisor of the United States Veterans' Bureau.

Coming as this does after the severe criticism of the Bureau by Dr. Emerson the suspicion may properly be entertained that resort has been made to a common retaliatory method by the Bureau.

Dr. Emerson's reputation is more fully recognized than Director Fobers, and those who have known of Dr. Emerson's work as professor of preventive medicine at Cornell, director of the Cleveland Hospital, and Health Survey Commissioner of the N. Y. Department of Health, and Colonel on duty with the American Expeditionary Force, will wonder why his standing and efficiency could be spoken of in terms used by Mr. Forbes. Until some other evidence is submitted the profession will continue to have confidence in Dr. Emerson.

THE BABY HYGIENE ASSOCIATION held a meeting September 15 for the consideration of ways and means for the maintenance of this charity.

Cardinal O'Connell is endorsing the movement. Six hundred babies have been cared for in wards nine and ten by the nurses provided by the Association.

GOVERNOR BAXTER of Maine has nominated Dr. Mary F. Cushman of Augusta, a member of the State Board of Registration in Medicine.

HOWARD ALLSTON BOUVÉ has been appointed interne in the Boston City Hospital and Randolph Kunhardt Byers interne in the Massachusetts General Hospital. The following named persons have been appointed internes in the New England Hospital for Women and Children: Adeline Ferri Muelchi, Rita Belle Tower, Josephine Louise Kaye.

DR. H. LINCOLN CHASE, Resident Physician at Herbert Hall Hospital, Worcester, for the past four years has accepted a position on the Staff of the Danvers State Hospital. Dr. Chase was at one time on the Staff of the Boston Psychopathic Hospital and later at the Boston State Hospital.

THE MYSTERY of the loss of 25 milligrams of radium, valued at 3000 dollars, from the Worcester City Hospital is still unsolved. The radium was the property of Dr. Philip H. Cook who is covered by insurance. An expert from Pittsburgh, with a radium detector, has been over the ground but has failed to locate it. It is thought that the radium was swept into the waste and burned in the furnace. During the time that elapsed before the discovery of the loss various contractors had hauled the cinders away for filling which made the search for the radium in the cinders hopeless.

IN THE STATISTICAL BULLETIN for August, the Metropolitan Life Insurance Company expresses great concern relative to the continual increase in puerperal septicaemia, for although the total mortality rate for puerperal conditions has fallen, the death rate from septicaemia during the first seven months of the year rose to 8.7 from 8.4 in 1920, while the rate for albuminuria and convulsion is only .2 less than it was for the same period in 1920.

The Metropolitan, after study of the subject and conference with authorities, contends that the causes "very directly reflect the character of obstetric service and the care which women receive during pregnancy."

The specific explanations of the increase of septicaemia are the increased employment of manual and instrumental aids to labor, the disregard of surgical asepsis, the possible periodic increase in virulence of pus-forming organisms, the possible influence of more cases of scarlet fever, the increased employment of midwives and more difficult housing conditions. No an-

alysis has been made of the relative mortality of states so that we do not know at the present time how Massachusetts stands, but the suggestive explanation of the actual fact of increased mortality should lead to renewed attention to the subject.

Obituary.

DR. FANNY BERLIN.

DR. FANNY BERLIN, who died in Roxbury on September 4, was for many years actively engaged in surgical work in Boston.

For a number of years she was connected with the New England Hospital for Women and Children, first as Resident Physician and later as Visiting Surgeon. She then retired from the hospital and devoted her entire time to private practice.

She began her surgical work when opening the abdomen was a very serious operation, and the prejudice against women surgeons was great. In spite of these handicaps she was a fearless surgeon, but took every opportunity to keep abreast of the times.

Dr. Berlin, whose real name was Berlinerblau, was born in Russia and, when very young, joined the Revolutionary Party. She was an intimate friend of the author, Stepaniak, and of Prince Kropotkin, and in full sympathy with his ideals. She joined the Colony of Russians in Switzerland where she studied medicine, and graduated from the Medical School at Berne. Soon afterwards she came to the United States.

She was a remarkable linguist, being able to speak Russian, English, German, French, Italian, and many mid-Europe dialects. This made it possible for her to help many foreign speaking people, to whom she gave generously of her time and skill.

Like most Russians she was very fond of music, and after retiring from practice, learned to play the violin as a recreation.

She was a woman of strong character and probably because of her out-spoken honesty had a group of loyal and devoted patients.

Miscellany.

THE DECISION OF THE SUPREME COURT RELATING TO THE VACCINATION OF SCHOOL CHILDREN.

BOARDS OF HEALTH and school authorities have been confused as to the next enforcement of vaccination laws so that a report of the decision of the Massachusetts Supreme Court presented below is of interest.

This followed the controversy in Haverhill after it was contended that certain school chil-

dren should be permitted to attend school without having been vaccinated, because of an exemption certificate.

Petition:

Mandamus to compel the school committee of Haverhill to admit to the schools of that city minor children of the petitioner.

The single question presented was whether the respondents are amenable to this process notwithstanding the refusal of the petitioner to have the children vaccinated or present certificates that their health would be endangered by vaccination.

Percy B. Spofford v.
Otis J. Carleton et als.

Essex
Braley, J.

May 28, 1921.

If the second paragraph of the regulations adopted by the respondents, who are the school committee of the city of Haverhill, relating to the admission of unvaccinated pupils is valid, the petition for a writ of mandamus requiring them to admit the three minor children of the petitioner to the public schools cannot be maintained.

It reads as follows:

"Every pupil in attendance at the public school, or who may hereafter be in attendance at such school who has been given a certificate by a physician stating that such pupil is not a fit subject for vaccination, shall be required to renew such certificate once in two months, provided, however, that in the case of such pupil who fails to renew such certificate as required, such pupil will not be excluded from school until a period of two weeks after failure to renew such certificate."

The express requirement, that children must be vaccinated before they can be admitted to the public schools first appears in St. 1855, c. 414, s. 2, which provides that "The school committee of the several towns and cities shall not allow any child to be admitted to or connected with the public schools, who has not been duly vaccinated."

By this enactment, which was continued in force by Gen. Sts. c. 41, s. 8, Pub. Sts. c. 47, s. 9, St. 1894, c. 498, s. 9, vaccination was made a condition precedent to the right of a child to attend the public schools. See St. 1884, c. 64, St. 1885, c. 198. It was not until St. 1898, c. 496, s. 11, that this requirement was modified by the words, "except upon presentation of a certificate signed by a regular practising physician that such child is an unfit subject for vaccination", and the same word is substantially found in R. L. c. 44, s. 6. It was unchanged by St. 1906, c. 371, when s. 6 was recast, but by St. 1907, c. 215, s. 6 was amended by inserting after the word "certificate," the words, "granted for cause stated therein." By St. 1918, c. 117, an act to make uniform

physicians' certificates of exemption from vaccination, s. 6 was further amended so that the certificate should be in conformity with the certificate required by R. L. c. 75, s. 139, as amended by St. 1902, c. 190, s. 2, and c. 544, s. 10. The result is that s. 6 as amended is to be read in connection with St. 1902, c. 190, s. 2, and c. 544, s. 10. The certificates accordingly must contain the actual words "while such conditions continue." See now G. L. c. 76, s. 15, c. 111, s. 183.

The intent of the Legislature is clear that the exemption is not to cover absolutely the entire period of the child's attendance, but the certificate is limited to the period when his physical condition is such that in the opinion of the certifying physician he is an unfit subject for vaccination. The respondents as the school committee of the city are given "a general charge and superintendence of all the public schools. . . ." R. L. c. 42, s. 27, G. L. c. 71, s. 37. The scope of the power is pointed out in *Morse v. Ashley*, 193 Mass. 294, 296; *Hammond v. Hyde Park*, 195 Mass. 29, 30, and cases there cited. It is sufficiently broad to promote and secure not only the best interests of the pupils, but the general welfare of the community in the management of schools. The respondents had authority notwithstanding the certificates which the petitioner presented, and which had been accepted when his children were admitted, to subsequently exclude them if an epidemic of smallpox had appeared. *Hammond v. Hyde Park*, 195 Mass. 29. It is true that in the case at bar this condition did not exist. But the uniform policy of the committee requires general vaccination as a preventive measure against the infection and spread of one of the most dangerous and highly contagious diseases with which mankind are afflicted, *Com. v. Jacobson*, 183 Mass., 242; *Jacobson v. Mass.*, 197 U. S. 11. It is common knowledge that a public school composed of pupils from all sections of the city, may become at any moment a source of danger to public health unless the laws relating to vaccination are strictly enforced.

The argument is pressed by counsel for the petitioner that under R. L. c. 44, s. 3, as amended by St. 1911, c. 268, every child has the right to attend the public schools of the city or town in which his parent or guardian has a legal residence, or in which the child himself actually resides, if he is without parent or guardian, and that this right cannot be abridged by the school committee. But this section also provides that school attendance is subject to such reasonable regulations as to number and qualifications of pupils to be admitted to the respective schools, and as to other such matters, as the school committee shall from time to time prescribe, and is to be read in connection with c. 6, and amendatory statutes to which refer-

ence has been made, the right of attendance may be made in some instances conditional. See *Avord v. Chester* 180 Mass., 20, *Com. v. Connecticut Valley St. Ry.*, 196 Mass. 309, 311.

The precedent condition as limited by the statute is controlling, and the exemption ceases when the physical condition of the child has become such that his health will not be endangered or impaired by vaccination. If to determine this further medical examination is necessary, it is wholly within the supervision of the parent or guardian, upon whom rests the burden of compliance with the law.

The regulation is not as matter of law so unreasonable or arbitrary as to be invalid, nor is it discriminatory. *Roberts v. Boston*, 5 Cush. 198; *Barnard v. Shelburn*, 216 Mass., 19, 21; *Wolff v. Wakefield*, 221 Mass. 427, 429 and cases cited.

The petition for the reasons stated must be dismissed.

So ordered.

Edward H. Hale and

Essex S. Abbott for the petitioners.

Frederick H. Magison for the respondents.

ENGLISH PROBLEMS.

September 6, 1921.

Mr. Editor:—

As there are a number of serious medical problems confronting Great Britain, in addition to her other troubles, the enclosed clippings may be of use to you for reference in the JOURNAL. Perhaps the problem of greatest present medical and future interest, is that disclosed by the census just published. In her population of 42,727,000 Great Britain now shows an excess of females of over 1,720,000. The discussions regarding the "sex women" are multitudinous. The effects of the excess on home-life, on morality, on industry, are demanding attention and serious consideration.

Another problem, medical in its importance also, is that of the probable overcrowding of the profession within a few years, with the large present increase of medical students.

I enclose the clippings for your information, if useful; and if not of use, please throw them in the wastebasket.

As I return to Boston within a short time, I shall try to call on you then.

Very truly yours,

CHAS. S. BUTLER.

The clippings referred to bring out the following points:—

Restraint by authority has always worn the aspect of temporary evil.

Distrust of bureaucracy confirmed by experience.

Rules and regulations carry implication of want of confidence and, although resented, are not so severe as we impose on ourselves.

This applies especially to medicine and after extolling the nobility of the profession, for although honor and respect paid to it is a justification, on the other hand, public suspicion reveals a weakening of professional spirit. The

control from without is an admission that the spirit of service has grown weak and must be reinforced by regulations and penalties. The profession has submitted to the imposition by the state of a system of fines for bad conduct. These fines are taken from a grant paid by the exchequer to doctors whose conduct has commended itself. The basal objection to this system is that it threatens the very fabric of the profession. The idea underlying the fines is distrust. In effect, the doctors have been warned that they cannot be relied on to maintain their own traditions. The state has drawn up a code of rules and forced doctors to subscribe to it. The acceptance of this code is a humiliation—nothing but a return to ideals can stay that process. Either the profession must restate its faith and refuse dictation or it must prepare to occupy a position inferior to that which it has enjoyed. This is a question for the profession of the future.

A woman physician writes:

"'Surplus' is not a pleasant word, unless we are prepared to regard 'surplus' women in the same way as we do a surplus at the bank and look upon them as a valuable form of capital. For a generation women will be in the majority, and they will be the most important factor for some time to come in helping the trade revival. Their work should have significance in every form of industry, excluding the luxury trades. Perhaps, if 'surplus' women were to be sorted out from the census return, the real surplus would be found in those whose lack of moral standards have increased the divorce lists so shamefully and in those who, married or single, have contributed to the moral degradation of their sex during and since the war and also in those for whom the luxury trades exist."

"The *Lancet*, in a leading article, suggests that the medical profession is not overcrowded, but that it is badly distributed. Meanwhile, four great services have difficulty in obtaining the doctors they require. This argument of bad distribution has been used before—when conscription of the profession was under discussion. It is a favorite of those who would like to organize medical practice on a broad basis. Yet it is undeniable that the work of the doctor has greatly increased and that this must mean more openings for him.

"On the other hand, an overcrowded profession, as things stand at present, would be so grave a danger that every means to ensure against it must be taken. It would afford to the Ministry of Health a great opportunity to set up a State Medical Service—for there would be abundance of volunteers. The doctor who refused to submit would be the more easily dealt with.

A CONFLICT COMING.

"There can be no doubt in the mind of any impartial observer that this is a danger far greater than any mere dearth of doctors. If the medical profession submits to any further encroachment by the State or any further organization it is lost. A great battle on this subject is coming as soon as the present permanent staff of the Ministry of Health is allowed a freer hand. The doctors will then have to fight for their freedom, for the honor of their high calling, for the very existence of their profession. If there are too many of them their chances will be materially weakened.

"It is important that the public should realize this. For, as soon as the doctors are defeated, the medical bureaucracy will fasten its talons on every home in the land. Compulsion is the weapon; notification, inspection, and tabulation the methods of use.

"At present the family doctor bars the way, and the voluntary hospital is another out-post. For the moment the medical bureaucracy is talking of 'consolidation' and 'intensive culture.' But its real object is made very clear in every line of the numerous reports issued by it. For indeed, unless it can bring the family doctor to heel, it stands in some danger of being swept away itself."

SOCIETY NOTICE.

THE NORTHERN BERKSHIRE MEDICAL SOCIETY.—The annual meeting of the Northern Berkshire Medical Society was held at Hotel Richmond, North Adams, September 13. A dinner was served at 6.30, following which a very interesting meeting was held. The officers elected for the ensuing year were as follows: Dr. M. M. Brown, North Adams, President; Dr. J. B. Hull, Williamstown, Vice-President; Dr. J. P. Brennan, North Adams, Secretary; Dr. E. R. Sullivan, North Adams, Treasurer.

RECENT DEATH.

DR. JOSEPH AUGUSTUS O'LEARY died at his home in Wakefield, September 21, 1921, at the age of fifty-nine. The son of John J. and Alice Conway O'Leary, he was born in Salem, November 29, 1861. He was graduated at Boston University School of Medicine in 1887 and settled in practice in Wakefield after taking postgraduate courses at Harvard Medical School. From 1889 to 1893 he was a member of the Wakefield board of health. He joined the Massachusetts Medical Society in 1907. Dr. O'Leary was unmarried and is survived by a sister.

MARRIED.

WILLARD BOYDEN HOWES to ESTHER MARIAN LEWIS, Detroit, Mich.